

## CAREX — ITS DISTRIBUTION AND IMPORTANCE IN UTAH

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### INTRODUCTION

The purpose of this report is to bring available information concerning the *Carex* species in Utah up to date. This includes such phases as latest nomenclature, notes on specific distribution, habitat requirements and economic notes. Identification keys and descriptions are also adapted for the group of entities found in Utah.

Possibly no group of vascular plants is less understood by range ecologists than are the sedges. This is mainly due to the large number of species and difficulty in identification, and the complexity of the group; however, lack of recent manuals and studies dealing specifically with this area has not helped the situation. It is hoped that this study will aid in the better understanding of this important group.

The genus *Carex* in Utah is represented by over 90 species. This places it among the largest genera in the state. Considering only the montane floras, it has the largest representation of any genus. Most of the plant communities from those of the bogs to the xeric mountain tops have representatives from this group. In the lower montane zones, about 70 percent of the *Carex* species are wet land plants, while in the alpine zone about 55 percent grow in mesic to drier sites. To certain limits, species of *Carex* gain importance in the plant communities as higher elevations are attained.

### IMPORTANCE AS A FORAGE PLANT

Based on palatability, species of *Carex* are nearly equivalent to the grasses. Such species as *C. physocarpa* and *C. rostrata* are relatively unpalatable and would have their grass counterparts; others, such as *C. bella*, are highly palatable and would compare favorably with the better native bluegrasses. The large majority of the species fits into the classification of moderate palatability.

Economically speaking, the genus *Carex* would compare favorably as a grass forage producer with the better grass genera with the exception of the *Agropyron*, *Bromus*, and *Poa*. *Carex* is of special importance at the higher elevations, especially in the alpine zone, where it is often the dominant constituent of many plant communities. In the Intermountain valleys, various species of *Carex* are of prime importance in the hay meadows.

### SOURCES OF INFORMATION

The author has had free access to the four major herbaria of the state, namely, Brigham Young University at Provo, Intermountain herbarium at Logan, University of Utah at Salt Lake City, and the Region 4 Forest Service herbarium at Ogden. Collections have been made from most of the major physiographic units (see map) over a period of four years. Valuable help in identification has been received from F. J. Hermann of the U. S. Department of Agriculture and J. T. Howell, California Academy of Science. Illustrations by Mrs. Kent H. McKnight.

The body of the report, made up of identification keys and species descriptions, is based primarily on Mackenzie's "North American Flora." Recent nomenclatural changes and additions followed generally Hermann's "Addenda to North American Carices." All keys were adapted to local flora wherever material was sufficient. Works of numerous students of the genus were also reviewed.

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<sup>0</sup> This report is the result of a study made under the direction of Dr. Bertrand F. Harrison of the Department of Botany at Brigham Young University, Provo, Utah.



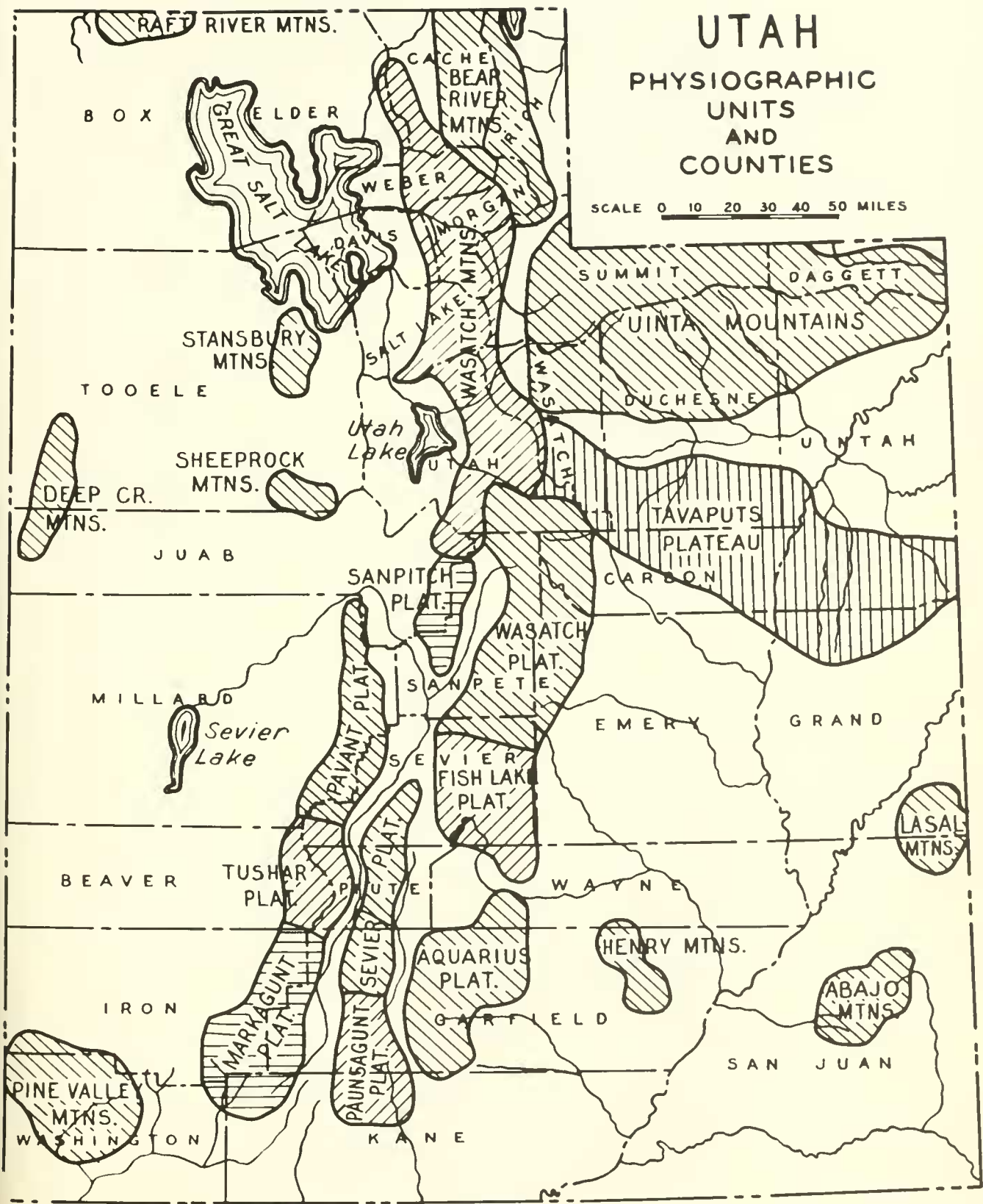


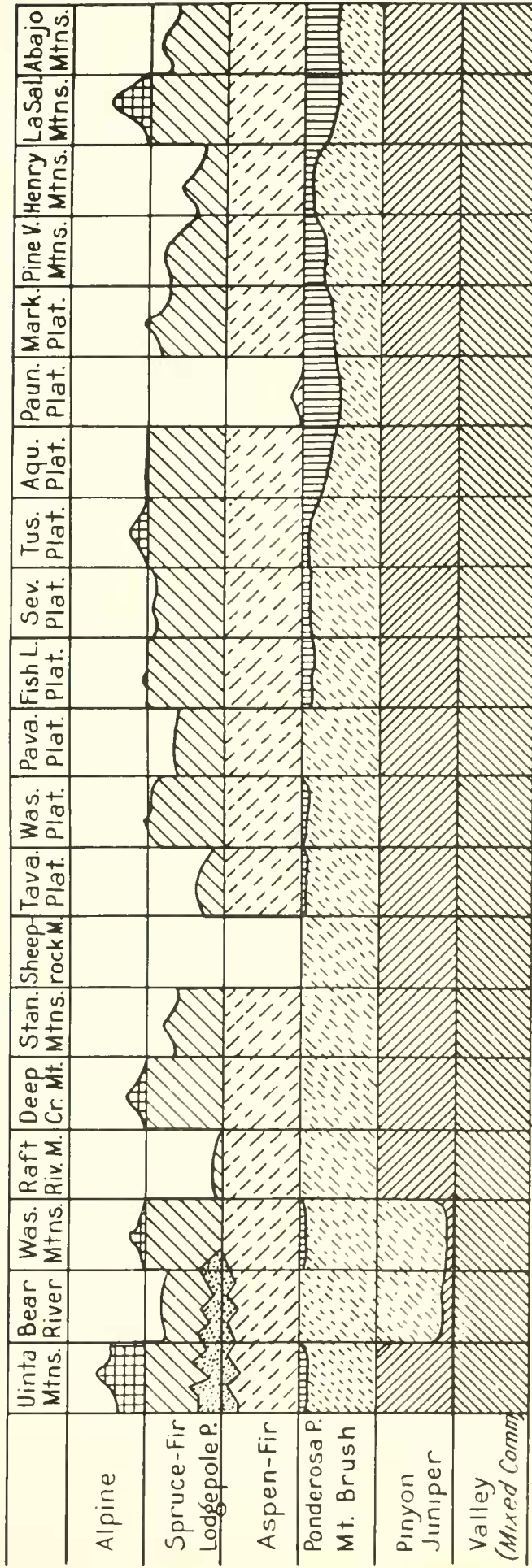
FIGURE 1





# ZONAL DEVELOPMENT BY PHYSIOGRAPHIC UNIT

FIGURE 2



*Not to Scale*



## GRAPHIC MATERIAL AND MAP

Distribution of the species within the State is tied to the major physiographic units (Fenneman, *Phy. Prov. of West. U. S.*, 1931). Mountains and higher plateaus are shown on the map. Because the carices in our area are primarily montane, only the elevated portions of the State are shown. Physiographic units instead of counties were used in the distribution studies because

they gave a truer representation. Counties in this State cover such broad sweeps of mountains and valleys that true locations would be hard to determine.

Zonal development for each physiographic unit is schematically shown in Figure 2. This is not to scale. Its chief value is to give the reader a quick picture of the zonal arrangement of the State's montane vegetation.

## CLASSIFICATION OF CAREX

*Carex* is a member of the Cyperaceae or sedge family. An artificial key to the Cyperaceae family is included, but only one genus, *Carex*, is treated in this paper.

## CYPERACEAE — SEDGE FAMILY

Plants grass-like; culms usually triangular and usually solid; leaves three-ranked when present (rarely two-ranked); sheaths closed; flowers perfect or imperfect, in spikes, each flower (rarely two or more) in axis of a scale; scales imbricate, spirally arranged in several rows, or sometimes two-ranked; perianth wanting or represented by hypogynous bristles, in some genera the pistillate or rarely both flowers enclosed in a sac-like organ (perigynium); stamens one-three; ovary one-celled and one-ovuled; stigma two-three; fruit an achene.

- |   |                   |
|---|-------------------|
| 1. Scales of spikes two-ranked; spikes flattened. ....  | <i>Cyperus</i>    |
| 1. Scales of spikes spirally imbricated; spikes terete or slightly flattened.                                 |                   |
| 2. Achenes enclosed in a sac-like organ (perigynium), this may be split on one side; flowers unisexual.       |                   |
| 3. Perigynium split to base or nearly so, enclosing both an achene and a staminate flower or flowers. ....    | <i>Kobresia</i>   |
| 3. Perigynium closed, except for a dorsal suture in the beak of some species, enclosing only the achene. .... | <i>Carex</i>      |
| 2. Achenes not enclosed in a perigynium; flowers not unisexual.   |                   |
| 4. Styles enlarged at base forming a persistent tubercle on the achene. ....                                  | <i>Eleocharis</i> |
| 4. Styles not enlarged at base and not forming a persistent tubercle on the achene.                           |                   |
| 5. Perianth a scale; plants annual. ....  | <i>Hemicarpha</i> |
| 5. Perianth of one to many bristles; plants annual or perennial.  |                   |
| 6. Perianth bristles many, long-silky, appearing as tufts of cotton at maturity. ....                         | <i>Eriophorum</i> |
| 6. Perianth of one to six short bristles, these may be barbed, smooth or pubescent. ....                      | <i>Scirpus</i>    |



A TYPICAL SEDGE PLANT  
(*Carex raynoldsii*)

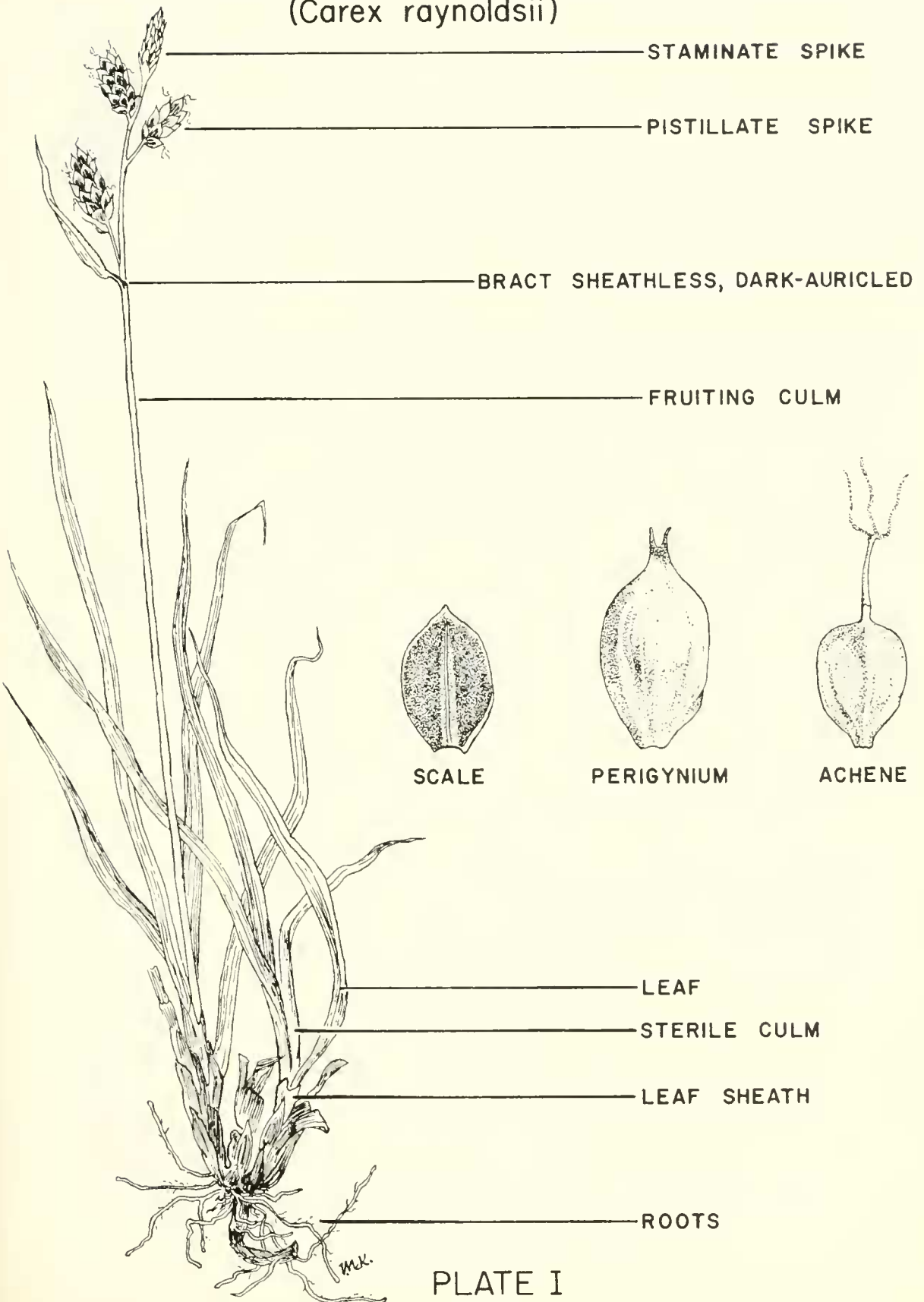
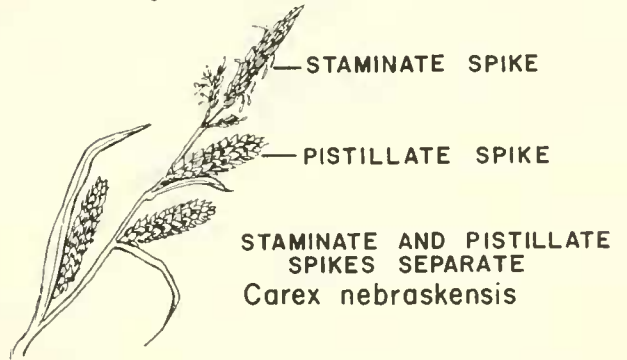
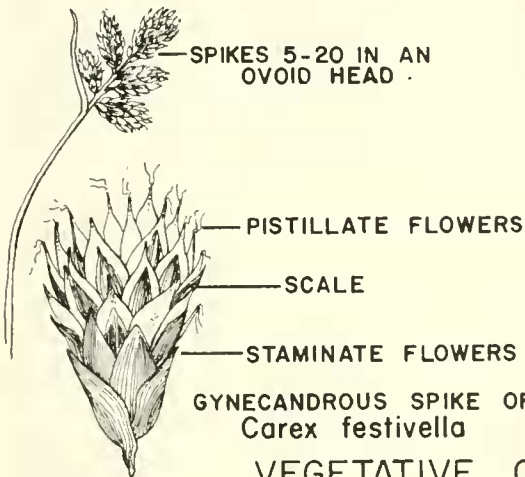
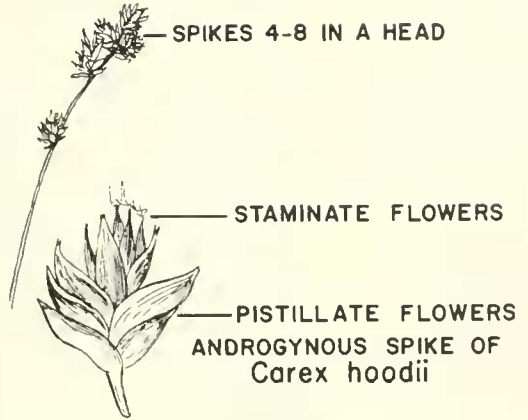
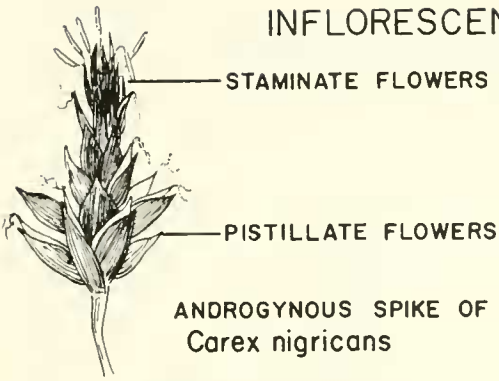


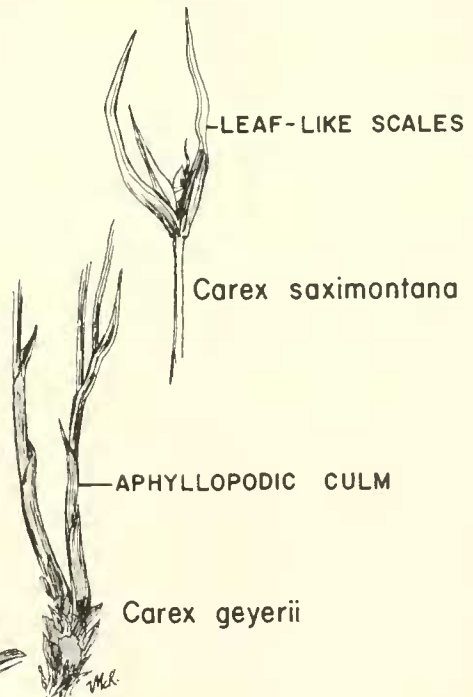
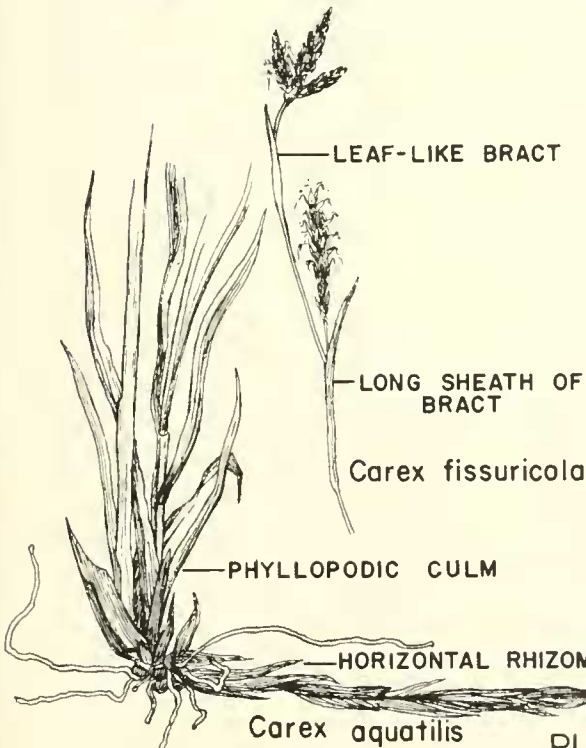
PLATE I



# INFLORESCENCE FORMS



# VEGETATIVE CHARACTERISTICS







REPRESENTATIVE PERIGYNIA OF CAREX



*C. nigricans*



*C. eleocharis*



*C. hoodii*



*C. stipata*



*C. canescens*



*C. microptera*



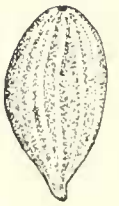
*C. rossii*



*C. pseudoscirpoidea*



*C. drummondiana*



*C. hassei*



*C. misandra*



*C. lanuginosa*



*C. atrata*



*C. kelloggii*



*C. rostrata*



## CAREX L. SP. PL. 972. 1753

Plants grass-like, perennial. Culms mostly triangular, generally solid; leaves three-ranked, the upper ones (the bracts) subtending the spikes or inflorescence; plants usually monoecious or dioecious in a few species; spikes one to many; flowers unisexual, solitary in the axis of a scale; stamens three (rarely two); pistillate flowers surrounded by a sac-like organ (perigynium); fruit a lenticular or trigonous achene with a single style branching above into two, three, or rarely four stigmas. A short setiform rachilla is present in some species.

## ARTIFICIAL KEY TO SECTIONS

- |                         |   |
|-------------------------|---|
| 1. Spike one .....      | A |
| 1. Spikes more than one |   |
| 2. Stigmas two .....    | B |
| 2. Stigmas three .....  | C |
- A. Spike one
- |   |                 |
|---|-----------------|
| 1. Stigmas two  |                 |
| 2. Plants caespitose; perigynia not reflexed.   |                 |
| 3. Perigynia lanceolate, obscurely nerved. ....   | 1. NARDINAE     |
| 3. Perigynia ovate, nerveless; spikes ovoid. ....   | 2. CAPITATAE    |
| 2. Plants rhizomatous; perigynia reflexed.....  | 4. DIOICAE      |
| 1. Stigmas three  |                 |
| 4. Pistillate scales deciduous; at least the lower perigynia re-<br>flexed at maturity, stipitate. ....               | 5. CALLISTACHYS |
| 4. Pistillate scales persistent; perigynia not reflexed at maturity.  |                 |
| 5. Spikes androgynous.  |                 |
| 6. Leaf-blades filiform.  |                 |
| 7. Plants rhizomatous, with slender, elongate root-<br>stocks; perigynia more or less inflated. ....                  | 3. INFLATAE     |
| 7. Plants densely caespitose; perigynia not inflated;<br>sheaths forming a fasciculate base.                          |                 |
| 8. Perigynia puberulent or pubescent above,<br>nerveless; staminate flowers conspicuous (over<br>half of spike). .... | 24. FILIFOLIAE  |
| 8. Perigynia glabrous, obscurely striate; staminate<br>flowers inconspicuous (less than half the<br>spike). ....      | 1. NARDINAE     |
| 6. Leaf-blades flat or canaliculate, not filiform.  |                 |
| 9. Perigynia coriaceous and shining. ....   | 25. OBTUSATAE   |
| 9. Perigynia not coriaceous and shining.  |                 |
| 10. Perigynia 3-4.5 mm. long, 1-6, closely flower-<br>ed. ....  | 32. RUPESTRES   |
| 10. Perigynia 5.5-7 mm. long, 1-3, separate to<br>overlapping. ....   | 33. FIRMICULMES |
| 5. Spikes entirely staminate or pistillate. ....  | 28. SCIRPINAE   |
- B. Spikes more than one; stigmas two.
- |  |             |
|--|-------------|
| 1. Lateral spikes sessile, short.  |             |
| 2. Perigynia not white-puncticulate; Beaks conspicuous   |             |
| 3. Culms from long creeping rootstocks; terminal spikes gen-<br>erally androgynous or dioecious, gynaeandrous in one<br>species. |             |
| 4. Perigynia not wing-margined; spikes androgynous or<br>dioecious.  |             |
| 5. Spikes aggregated into a globose or ovoid head,<br>androgynous. ....  | 6. FOETIDAE |

5. Spikes not aggregated, lower distinct, androgynous or dioecious. .... 7. DIVISAE
4. Perigynia wing-margined at least above; terminal spike gynaeandrous (our species). .... 9. ARENARIAE
3. Culms cespitose; occasionally with short rhizomes, never long-creeping.
6. Spikes androgynous.
7. Perigynia bodies abruptly contracted into beaks; culms not flattened on drying.
8. Spikes few, if over 10, greenish. (dry lands) .... 12. BRACTEOSAE
8. Spikes numerous; sheaths often red-dotted ventrally. (wet lands) ..... 14. PANICULATAE
7. Perigynia with body tapering into a beak, culms flattened on drying; sheaths cross-rugulose ventrally. .... 15. VULPINAE
6. Spikes not androgynous, upper spike gynaeandrous or rarely staminate, lateral spikes gynaeandrous or pistillate.
9. Perigynia at most thin-edged, the lower part of the body spongy-thickened.
10. Perigynia spreading or ascending to maturity. 19. STELLULATAE
10. Perigynia appressed. .... 20. DEWEYANAE
9. Perigynia wing-margined, not spongy-thickened at base. .... 21. OVALES
2. Perigynia white-punctulate; beak inconspicuous; spikes usually stiffly compact. .... 17. HELEONASTES
1. Lateral spikes peduncled or elongate; terminal spike staminate or bisexual.
11. Perigynia beakless or very short beaked, not lustrous.
12. Lowest bract long-sheathing; perigynia pulverulent or golden-yellow at maturity. .... 38. BICOLORES
12. Lowest bract sheathless or short-sheathing; perigynia not as above. .... 61. ACUTAE
11. Perigynium beak 0.5 mm. or more long, its body blackish and lustrous. — *C. physocarpa* in..... 70. VESICARIAE
- C. Spikes more than one; stigmas three.
1. Perigynia pubescent or puberulent.
2. Pistillate flowers few (1-20); achenes closely enveloped. .... 27. MONTANAE
2. Pistillate flowers many (15-200); achenes more or less loosely enveloped.
3. Leaves septate-nodulose; styles deciduous; sheaths glabrous in our species. .... 54. HIRTAE
3. Leaves not septate-nodulose; styles persistent; sheaths pubescent. — *C. sheldonii* in ..... 68. PALUDOSAE
1. Perigynia glabrous.
4. Staminate scales united at base; at least the lower pistillate scales leaf-like. .... 23. PHYLLOSTACHYAE
4. Plants not as above.
5. Perigynia only slightly inflated if at all, nerveless or moderately nerved; beak not bidentate or only moderately so; styles deciduous; plants usually not coarse and tall.
6. Lower bract long-sheathing.
7. Perigynium beak entire or nearly so.
8. Perigynia suborbicular in cross-section, with many raised nerves; beak conic, rather conspicuous; scales dark-colored. .... 41. GRANULARES

- |   |                      |
|---|----------------------|
| <ul style="list-style-type: none"> <li>8. Perigynia trigonous, nerves inconspicuous, beak minute; spikes drooping on capillary peduncles; scales light-colored. ....</li> </ul>   | 48. CAPILLARES       |
| <ul style="list-style-type: none"> <li>7. Perigynium beak bidentate.           <ul style="list-style-type: none"> <li>9. Perigynia generally broad and trigonous, greenish-colored; scales light-colored; spikes with spreading perigynia. ....</li> <li>9. Perigynia lanceolate or ovate, flat or flat-triangular; scales dark-colored; spikes with appressed or ascending perigynia. ....</li> </ul> </li> </ul>  | 50. EXTENSAE         |
| <ul style="list-style-type: none"> <li>6. Lower bract sheathless or very short-sheathing (under 2 mm.).           <ul style="list-style-type: none"> <li>10. Roots clothed with a yellow felt; terminal spike generally staminate, occasionally gynaeandrous; lower bract occasionally short-sheathing. ....</li> <li>10. Roots not clothed with yellow felt; terminal spike gynaeandrous or staminate, rarely pistillate; lower bract sheathless. ....</li> </ul> </li> </ul>  | 52. FERRUGINEAE      |
| <ul style="list-style-type: none"> <li>5. Perigynia strongly inflated, smooth, shining and strongly ribbed; beak deeply bidentate (in ours); styles persistent; plants usually stout and tall.           <ul style="list-style-type: none"> <li>11. Pistillate scales with a scabrous awn; one terminal spike staminate. ....</li> <li>11. Pistillate scales with a rather smooth awn where present; generally more than one staminate spike above.               <ul style="list-style-type: none"> <li>12. Perigynia subcoriaceous and firm; sheaths (in ours) soft-hairy. ....</li> <li>12. Perigynia membranaceous; sheaths not soft-hairy. ....</li> </ul> </li> </ul> </li> </ul> | 59. LIMOSAE          |
|   | 60. ATRATAE          |
|   | 67. PSEUDO-CYPHEREAE |
|   | 68. PALUDOSAE        |
|   | 70. VESICARIAE       |

KEY TO SPECIES OF *CAREX* OF UTAH

1. NARDINAE Tuckerm.  
 Represented by one species in our area ..... 1. *C. hepburnii*
2. CAPITATAE Christ  
 Represented by one species in our area. .... 2. *C. capitata*
3. INFLATAE Kukenth.  
 1. Perigynia ovoid, thin-membranous, loosely enveloping achene, rounded at base. .... 3. *C. engelmannii*  
 1. Perigynia lanceolate to ovoid lanceolate, distended by achene which nearly fills it, strongly stipitate at base. .... 4. *C. subnigricans*
4. DIOICAE Wormsk.  
 Represented by one species in our area. .... 5. *C. gynocrates*
5. CALLISTACHYS (Heuffel) Graebn.  
 1. Plants densely cespitose; leaf-blades 2-4 per culm, less than 2 mm. wide, folded; staminate flowers few. .... 6. *C. pyrenaica*  
 1. Plants loosely cespitose, with short rhizomes; leaf-blades 4-9 per fertile culm, 2 mm. or more wide, flat; staminate flowers many and conspicuous. .... 7. *C. nigricans*
6. FOETIDAE Tuckerm.  
 1. Leaf-blades 2-4 mm. wide; perigynia not inflated; scales brown to blackish, green or light midvein. .... 8. *C. vernacula*  
 1. Leaf-blades 1.5 mm. wide or less; perigynia inflated, very membranaceous; pistillate scales brownish with lighter midveins. .... 9. *C. perglobosa*
7. DIVISAE Christ  
 1. Culms obtusely triangular; leaves narrowly involute or canaliculate; rootstocks slender.  
 2. Perigynium beak long (1.75 mm.); plants dioecious or nearly so; heads large. (1.5 — 5 cm. long) ..... 10. *C. douglasii*  
 2. Perigynium beak short (0.5-0.75 mm.); plants monoecious; spikes androgynous; heads relatively small. .... 11. *C. eleocharis*  
 1. Culms sharply triangular; leaves flat or channeled.  
 3. Rootstocks slender; perigynia unequally biconvex, 1.75-3 mm. long. .... 12. *C. simulata*  
 3. Rootstocks stout; perigynia plano-convex, 3-4 mm. long. .... 13. *C. praegracilis*
9. ARENARIAE Kunth  
 Represented by one species in our area. .... 14. *C. foenea*
12. BRACTEOSAE Kunth  
 1. Perigynium beak obliquely cleft dorsally; spikes with generally 2-5 perigynia. .... 15. *C. vallicola*  
 1. Perigynium beak bidentate.  
 2. Inflorescence ovoid to suborbicular; spikes densely capitate; perigynia soon brownish, 3.5-5 mm. long. .... 16. *C. hoodii*  
 2. Inflorescence linear-oblong to oblong; lower spike or two little separate; perigynia 2.5-4.5 mm. long ..... 17. *C. occidentalis*
14. PANICULATAE KUNTH  
 Represented by one species in our area. .... 18. *C. cusickii*
15. VULPINAE Kunth  
 Represented by one species in our area. .... 19. *C. stipata*



## 17. HELEONASTES Kunth

- |   |                            |
|---|----------------------------|
| 1. Spikes androgynous; perigynia unequally biconvex. ....   | 20. <i>C. disperma</i>     |
| 1. Spikes (at least uppermost) gynaeandrous; perigynia plano-convex.  |                            |
| 2. Spikes 2-5, congested; plants low-growing (0.5-3 dm. high) in small, loose clumps; scales brownish.  |                            |
| 3. Perigynia small, 1.5-2 mm. long, ascending or rather loosely spreading at maturity; scales somewhat shorter than perigynia; spikes 4-5. ....   | 21. <i>C. praeceptorum</i> |
| 3. Perigynia 2-3.5 mm. long, closely arranged and appressed-ascending; scales exceeded by tips only of mature perigynia; spikes 2-4. ....         | 22. <i>C. bipartita</i>    |
| 2. Spikes 4-10, lower ones distinct; plants 1-8 dm. high, in dense clumps; scales light-colored.  |                            |
| 4. Perigynium beak fairly long and scabrous with a dorsal suture its entire length; perigynia very thin-walled with distinctly raised veins. .... | 23. <i>C. brunnescens</i>  |
| 4. Perigynium beak very short and inconspicuous, dorsal suture short or absent; perigynia with thicker walls and obscurely nerved. ....           | 24. <i>C. canescens</i>    |

## 19. STELLULATAE Kunth.

- |   |                         |
|---|-------------------------|
| 1. Perigynia rather abruptly narrowed into a beak one-third to one-fourth its body length, shallowly bidentate, body concavo-convex, ovoid, 1.5-2 mm. wide; sheaths hyaline ventrally, not red-dotted. .... | 25. <i>C. interior</i>  |
| 1. Perigynia contracted into a beak more than half the length of the body, rather deeply bidentate, body plano-convex, lanceolate, 1.25-mm wide; sheaths hyaline ventrally, often red-dotted. ....          | 26. <i>C. angustior</i> |

## 20. DEWEYANAE Tuckerm

- |  |                         |
|--|-------------------------|
| 1. Spikes usually 3 or 4; perigynia 4.5-5.5 x 1.5-2 mm., obscurely nerved, tapering into a serrulate, shallowly bidentate beak. .... | 27. <i>C. deweyana</i>  |
| 1. Spikes 5-8; perigynia 4-4.5 x 1-1.3 mm., rather strongly nerved, abruptly tapering into a serrulate, deeply bidentate beak. ....  | 28. <i>C. bolanderi</i> |

## 21. OVALES Kunth

- |   |                            |
|---|----------------------------|
| 1. Bracts not conspicuously exceeding head.   |                            |
| 2: Perigynia with beaks slender, nearly terete and scarcely margined at tip. Predominantly Western North America. ....  | Group A.                   |
| 2. Perigynia with beaks flattened and margined to tip, serrulate to apex. Predominantly Eastern North America. ....   | Group B.                   |
| 1. Bracts conspicuously exceeding head. ....  | Group C.                   |
| Group A. Perigynia with slender nearly terete beaks.  |                            |
| 1. Scales shorter and narrower than perigynia, largely exposing perigynia above.  |                            |
| 2. Perigynia 3.5-7 mm. long, flat and scale-like to strongly plano-convex.  |                            |
| 3. Perigynia strongly plano-convex, thick, copper-colored at maturity, 3.5-5 mm. long. ....   | 29. <i>C. pachystachya</i> |
| 3. Perigynia not strongly plano-convex, generally much flattened and scale-like.  |                            |
| 4. Perigynia light-green to stramineous, 3.5-5 mm. long; scales dull-brown to blackish-brown.   |                            |
| 5. Perigynia strongly wing-margined (0.3-0.45 mm. wide), ratio of width to length 0.39-0.50; scales dark-chestnut to brownish-black; spikes appressed-ascending. .... | 30. <i>C. festivella</i>   |

5. Perigynia narrowly wing-margined (0.03 mm. wide), ratio of width to length 0.34-0.40; scales usually dull-brown; spikes with perigynia spreading. .... 31. *C. microptera*
4. Perigynia very dark, brownish-black to blackish tinged, 4.5-7 mm. long; scales dark-brown to black.
6. Perigynia narrowly lanceolate, 5-7 mm. long, finely many-nerved ventrally; beaks appressed; culms stiff, erect. .... 32...*C. ebenea*
6. Perigynia ovate, 4-5 (6) mm. long, nerveless ventrally, beaks conspicuous; culms slender, often decumbent. .... 33. *C. haydeniana*
2. Perigynia small, 3-5 mm. long or less, plano-convex, the lower part of perigynium nearly filled by achene.
7. Perigynia with margins of beak not serrulate; scales blackish. .... 34. *C. illota*
7. Perigynia with margins of beaks strongly serrulate; scales reddish-brown. .... 35. *C. subfusca*
1. Scales about length of perigynia and nearly same width above, largely concealing them.
8. Heads with moniliform spikes, nodding or flexuose. .... 38. *C. praticola*
8. Heads with approximate spikes, erect.
9. Perigynia abruptly contracted into a short (1 mm. long or less), conspicuously hyaline beak; culms 1-3 dm. high, in large stools.
10. Perigynia oblong-ovate, rather conspicuously margined, 4-6 mm. long. .... 36. *C. phaeocephala*
10. Perigynia linear-oblongate, very narrowly margined, boat-shaped, 3.5-4 mm. long. .... 37. *C. leporinella*
9. Perigynia tapering into a longer beak (near 2 mm. long), hyaline tipped but not conspicuously so; culms in small clumps, often with short-prolonged rootstocks.
11. Perigynia 5-6 mm. long, culms obtusely triangular, thick at base. .... 39. *C. eastwoodiana*
11. Perigynia 5.8-8 mm. long; culms acutely triangular, slender at base. .... 40. *C. petasata*
- Group B. Perigynia with flattened beaks.
1. Scales shorter than perigynia and noticeably narrower above, exposing perigynia above.
2. Perigynia 3-3.5 mm. long, thick, firm, plano-convex; tip of beak little flattened. .... 35. *C. subfusca*
2. Perigynia 4.5-7.5 mm. long, body suborbicular, flat, with broad wings.
3. Perigynia light-green or straw-colored, 4.5-5.5 mm. long; culms 1-4 dm. high. .... 41. *C. stramineiformis*
3. Perigynia olive-green or brownish, 6-7.5 mm. long; culms 6-8 dm. high. .... 42. *C. egglestoni*
1. Scales about the length of perigynia and nearly as wide above, nearly concealing perigynia; perigynia wing-margined at base; rootstocks short-prolonged. .... 43. *C. xerantica*
- Group C. Bracts conspicuously exceeding head.
- Lower bract not appearing like a continuation of the culm. .... 44. *C. athrostachya*
23. PHYLLOSTACHYAE Tuckerm.
- Represented by one species in our area. .... 45. *C. saximontana*

## 24. FILIFOLIAE Tuckerm.

1. Pistillate scales with very broad, bright-white, hyaline margins; perigynia obtusely angled, 3-5 mm. long, puberulent above. .... 46. *C. filifolia*
1. Pistillate scales reddish-brown with dingy-white-hyaline margins; perigynia rather sharply angled, 2.5-4 mm. long, sparsely scabrous above. .... 47. *C. elynoides*

## 25. OBTUSATAE Tuckerm.

- Represented by one species in our area. .... 48. *C. obtusata*

## 27. MONTANAE Fries

1. Upper pistillate spikes with (1) 3-8 (15) perigynia; perigynia 2.8-4.5 mm. long, ciliate-serrulate and deeply bidentate beak. .... 49. *C. rossii*
1. Upper pistillate spikes with 1-3 perigynia; perigynia 3.5-5 mm. long, beak shallowly bidentate. .... 50. *C. pityophila*

## 28. SCIRPINAE Tuckerm.

- Represented by one species in our area. .... 51. *C. pseudoscripoidea*

## 32. RUPESTRES Tuckerm.

- Represented by one species in our area. .... 52. *C. drummondiana*

## 33. FIRMICULMES Kukenth.

- Represented by one species in our area. .... 53. *C. geyeri*

## 38. BICOLORES Tuckerm.

1. Perigynia fleshly, smooth, golden-orange (drying brown); spikes loosely few-flowered. .... 54. *C. aurea*
1. Perigynia dry, whitish-papillose; spikes closely flowered.
2. Foliose bract with inner summit of sheath truncate; culms slender but erect, 0.5-3 dm. high; perigynia 2.5-3 mm. long. .... 55. *C. hassei*
2. Foliose bract with inner summit of sheath "V" shaped or arcuate; culms slender and spreading, (1) 3-6 dm. high; perigynia 2-3 mm. long. .... 56. *C. garberi*

## 41. GRANULARES O. F. Lang

- Represented by one species in our area. .... 57. *C. crawei*

## 48. CAPILLARES Asch.

- Represented by one species in our area. .... 58. *C. capillaris*

## 50. EXTENSAE Fries.

- Represented by one species in our area. .... 59. *C. viridula*

## 52. FERRUGINEAE Tuckerm.

1. Terminal spike generally gynaeandrous, slender peduncled and drooping; culms slender and nodding above. .... 60. *C. misandra*
1. Terminal spike pistillate or occasionally with few perigynia.
2. Perigynia tapering into a hardly differentiated beak about 1 mm. long; pistillate scales ovate-oblong, obtusish. .... 61. *C. ablata*
2. Perigynia abruptly contracted into a beak one-fourth to one-third the body length; pistillate scales narrowly ovate, acute, cuspidate or short-awned. .... 62. *C. fissuricola*

## 54. HIIRTAE Tuckerm.

- Represented by one species in our area. .... 63. *C. lanuginosa*

## 59. LIMOSAE Tuckerm.

1. Pistillate scales persistent, ovate to suborbicular, as long to longer than perigynia; plants strongly rhizomatous with forked rhizomes. .... 64. *C. limosa*
1. Pistillate scales soon deciduous, lanceolate to ovate-lanceolate, usually exceeding the perigynia; plants loosely cespitose. .... 65. *C. paupercula*

## 60. ATRATAE Kunth

1. Terminal spike staminate.
  2. Perigynia strongly flattened, nerved; leaves bunched above the base. .... 66. *C. tolmiei*
  2. Perigynia round or obtusely triangular in cross-section, little or not flattened.
    3. Perigynia suborbicular in cross-section, 3.25-4.5 mm. long; staminate spike nearly sessile; culms stout. .... 67. *C. raynoldsii*
    3. Perigynia triangular in cross-section, 2-3.5 mm. long; staminate spike on a slender peduncle; culms slender. .... 68. *C. aboriginum*
1. Terminal spike gynaeandrous.
  4. Culms leafly at base, persistent leaves of previous years conspicuous.
    5. Perigynia not flat, more or less inflated, obtusely-triangular or compressed-suborbicular.
      6. Perigynia 2-3 mm. long, obtusely-triangular; spikes aggregated into a head 4-8 mm. long; leaves 1-3 mm. wide; scales much shorter than perigynia. .... 69. *C. media*
      6. Perigynia 3-5 mm. long, compressed-suborbicular; spikes aggregated into a head 10-12 mm. long; leaves 3-6 mm. wide; scales shorter to equaling perigynia. .... 70. *C. nelsonii*
    5. Perigynia flat, except where distended over the achene.
      7. Spikes contiguous, closely congested, sessile.
        8. Culms slender and nodding; spikes dense; perigynia smooth, not at all ciliate-scabrous. .... 72. *C. pelocarpa*
        8. Culms stiffly erect; spikes with the perigynia spreading at maturity; perigynia granular and sparsely ciliate-scabrous. .... 73. *C. nova*
      7. Spikes not closely congested, at least the lower one separate.
        9. Spikes sessile or lower short peduncled (peduncle less than the length of its spike.)
          10. Perigynia papillose or granular above.
            11. Culms stiffly erect; scales with conspicuous white-hyaline margins. .... 71. *C. albo-nigra*
            11. Culms nodding, often reclining; scales at most only narrowly hyaline.
              12. Upper pistillate scales longer than perigynia (usually conspicuously so), brown copper-colored. .... 76. *C. chalciolepis*
              12. Upper pistillate scales shorter than perigynia; blackish-purple or blackish-brown, fading with age. .... 77. *C. atrata*
          10. Perigynia not at all papillose or granular. .... 75. *C. epapillosa*
      9. Spikes, at least the lower, long peduncled (peduncles as long as its spike or longer.).
        13. Lateral spikes linear, gynaeandrous, lower ones nodding on slender, roughish peduncles. ... 74. *C. bella*
        13. Lateral spikes oblong or ovoid, pistillate; peduncles smooth. .... 77. *C. atrata*
4. Culms not leafly at base (aphyllopodic); perigynia triangular-biconvex; scales usually strongly exceeding perigynia, awned or cuspidate. .... 78. *C. buxbaumii*



## 61. ACUTAE Fries.

1. Lower bract shorter than inflorescence; pistillate scales with rather inconspicuous midveins; perigynia purple-blotched above.
2. Spikes approximate above, lower ones somewhat separate; lower bract leaf-like.
3. Rhizomes purplish-red, stoutish; leaves numerous (8-20) per culm, clustered near base, all blade-bearing. .... 79. *C. bigelowii*
3. Rhizomes light-tan, stout (3-4 mm.); leaves few (about 5), basal but few of lower ones not blade-bearing. .... 81. *C. campylocarpa*  
ssp. *affinis*
2. Spikes closely aggregated; lower bract squamiform, much shorter than culm. .... 80. *C. scopulorum*
1. Lower bract equaling or exceeding inflorescence; pistillate scales with lighter midvein usually conspicuous; perigynia light-colored in most species.
4. Perigynia with conspicuous raised nerves.
5. Plants caespitose, forming rather large clumps; rootstocks slender; perigynia ovate, 1.5-3 mm. long, beaks entire. .... 82. *C. kelloggii*
5. Plants loosely caespitose and strongly rhizomatous with stout horizontal rhizomes; perigynia obovate, 2.7-3.5 mm. long, beaks bidentate. .... 83. *C. nebraskensis*
4. Perigynia nerveless except for marginal ribs.
6. Culms purplish at base and from long, slender, brown horizontal rhizomes; perigynia 2-3 mm. long. .... 84. *C. aquatilis*
6. Culms light-tan at base and from thick, light-colored rhizomes; perigynia 2.7-3.5 mm. long. .... 81. *C. campylocarpa*  
ssp. *affinis*

## 67. PSEUDO-CYPHEREAE Tuckerm.

- Represented by one species in our area. .... 85. *C. hystericina*

## 68. PALUDOSAE Fries.

1. Perigynia glabrous, 7-10 x 2 mm., beak bidentate with teeth 1.2-3 mm. long; sheaths soft-hairy. .... 86. *C. atherodes*
1. Perigynia hairy, 5-6 mm. long, beaks bidentate with teeth 0.75-1 mm. long; sheaths short-pubescent. .... 87. *C. sheldonii*

## 70. VESICARIAE Tuckerm.

1. Stigma normally two; perigynia scarcely inflated, 3-5 mm. long; beaks 0.5-1 mm. long. .... 88. *C. physocarpa*
1. Stigmas normally three; perigynia from scarcely to much inflated.
2. Perigynia reflexed or horizontally spreading, 7-10 mm. long and much inflated; sheaths loose, forming a prolonged, truncate summit; bracts several times exceeding the inflorescence. .. 89. *C. retrorsa*
2. Perigynia ascending or spreading; sheaths tight and concave at mouth; lower bract shorter, moderately exceeding inflorescence.
3. Rootstocks short-creeping, long horizontal rhizomes absent; culms ascending, not erect.
4. Perigynia 4-8 mm. long, 3-4 mm. wide, rather abruptly narrowing into a beak; scales narrower than and from half to as long as perigynia. .... 90. *C. vesicaria*
4. Perigynia 7-10 mm. long and 2-3 mm. wide, tapering into a beak; scales narrower than and from a third to half the length of perigynia. .... 91. *C. exsiccata*
3. Rootstocks short but sending forth long, stout, horizontal rhizomes; culms erect. .... 92. *C. rostrata*

## DESCRIPTION OF SPECIES

1. *Carex hepburnii* Boot., in Hook. Fl. Bor. Am. 2:209. pl. 207. 1839. (*C. nardina* Fries, var. *hepburnii* Kuenth.)

Plants densely cespitose; culms short and wiry, 2-15 cm. long with old sheaths forming a fasciculate base; leaves very narrow (0.25 mm.), wire-like; spikes solitary, androgynous, with 5-15 erect-appressed perigynia, staminate portion inconspicuous; scales, brownish, with narrow white-hyaline margins, wider than and slightly longer to shorter than perigynia; perigynia biconvex or plano-convex, 3-4.5 x 1.2-2 mm., lanceolate, glabrous, obscurely striate on both faces, light to dark brown, ciliate above, abruptly beaked; beak 0.5 mm. long, hyaline and emarginate at apex; stigmas 2 or 3; rachilla present.

This species is often confused with *C. elynoides* which is also a sedge of dry alpine summits. It differs from that plant, however, in the following characters: 2 or 3 stigmas instead of consistently 3, staminate portion of spike inconspicuous, pistillate scales lack the conspicuous hyaline margin, and the perigynia glabrous and generally somewhat larger.

## DISTRIBUTION

*General*—Southern Alaska and southward in the high mountains to Colorado, Utah, and Nevada.

*Utah*—Collected from the Uinta, Wasatch and La Sal Mountains and the Tushar Plateau.

## HABITAT

Mackenzie lists *C. hepburnii* as a species of dry alpine summits and slopes. Some of our specimens have been collected from streamside meadows.

2. *Carex capitata* L., Syst. Nat. ed. 10. 1261. 1759.

Plants loosely cespitose with short-creeping, purplish-red rootstocks; culms 1-3.5 dm. high, slender, triangular and roughened above, purplish at base, old leaves persistent; leaves 2-4 per culm, involute; spikes solitary, androgynous, globose or oval, 4-10 mm. long; scales brown with broad hyaline margin and apex, shorter and narrower than perigynia; perigynia 2-3.5 x 1-2 mm., plano-convex, oval, greenish to light brown, with sharp smooth edges, spreading, abruptly beaked; beak generally from one-fourth to one-third the length of perigynium body, slender; rachilla present but shorter than achene.

## DISTRIBUTION

*General*—An Arctic-Alpine species extending across America from Alaska to Greenland

and southward in isolated locations on the higher mountains to New Hampshire, Colorado, Utah, and Nevada; also northern Eurasia.

*Utah*—Two specimens from Utah have been checked by the author, Maguire 15181, from the Bear River Mountains, and Lewis 512 from the Uinta Mountains.

## HABITAT

Mackenzie lists it as a species of alpine summits and slopes. Of the two specimens listed above one was from a rather dry site while the other was from a damp alpine meadow.

3. *Carex engelmannii* L. H. Bailey, Proc. Am. Acad. 22:132. 1886.

Plants cespitose with slender, brown, scaly rhizomes; culms 0.5-2 dm. high, slender, obtusely angled, generally smooth, with dried-up leaves at base; leaves several, basal, blades filiform, 0.5 mm. wide, stiff; spikes solitary, androgynous, forming a dense oval head, staminate flowers inconspicuous, perigynia spreading at maturity; scales ovate, light to reddish-brown with light centers and hyaline margins, acute to acuminate, near the size of the perigynia; perigynia 4-5 x 2-3 mm., very membranous, somewhat inflated, much larger and only loosely enveloping achene, brownish, smooth, tapering to a minute, hyaline beak.

## DISTRIBUTION

*General*—High mountains, from Washington and southward to Utah and Colorado.

*Utah*—Three specimens studied would indicate that *C. engelmannii* is an occasional species in some of the higher mountains of the State. One old collection in the Brigham Young University herbarium, collected from near Alta (Salt Lake County, Wasatch Mountains) in 1889 was the first evidence seen as to the presence of that species in the state. Later in working the Forest Service collection at Ogden, Utah, two more specimens were found; McDonald 955 (F.S. 64,684) filed in the herbarium under the name of *C. pyrenaica* Wahl. and McDonald 1099 (F.S. 68,073). The latter plant was one of two different species on one sheet under the name of *C. hepburnii*. Specimens were collected near the head of Bullion Canyon, Tushar Plateau, Piute County, Utah in 1931 and 1932.

## HABITAT

Open alpine slopes and ridgetops often found growing in nearly pure stands.

4. *Carex subnigricans* Stacey, Leaf. West. Bot. 2:166 (1930). (*C. rachillis* Mag.) Brittonia 5:199-200. (1944). See also Leaf. of West. Bot. V:36-40 (1947).

Plants rhizomatous; culms developing singly or few, 5-20 cm. high, obtuse, smooth, exceeding leaves, old leaves conspicuous at base; leaves 3-10 cm. long, 0.25-1.25 mm. wide, blades involute-filiform; sheaths striate dorsally, hyaline ventrally with callous spot generally developing behind ligule; spikes solitary, androgynous, ovoid, 8-12 x 3-5 mm.; pistillate scales reddish-brown to straw-colored, with light centers and white-hyaline margins, equal to shorter than perigynia, persistent; perigynia 2.5-4 x 1-1.5 mm., lanceolate to ovoid-lanceolate, brownish, nerveless, strongly stipitate, beak minute with hyaline orifice; rachilla from shorter to slightly exceeding achene.

Maguire originally assigned the Utah entity to subspecific status, viz. *C. subnigricans* subsp. *pallida*. Later he gave it full specific rank under the name of *C. rachillis*. According to Howell (1947), the differences between Maguire's and Stacey's plants are small. In the former, the callous spot back of the ligule develops only occasionally, and the rachilla is often shorter than the achene. Based on the original description, the Utah plant is not as leafy as Stacey's plant and the perigynia are smaller (Utah plant perigynia 2.5-3 mm. long, Stacey's plant 3.5-4 mm. long.)

#### DISTRIBUTION

*General*—From the Sierra Nevada range of California northward and westward to Oregon, Idaho, and Utah.

*Utah*—Known only from the Uinta Mountains. Maguire, Hobson and Maguire 146688.

#### HABITAT

In the Sierra Nevada Mountains, *C. subnigricans* is a rather common plant of the mountain meadow and moist rocky slopes at about timberline, but may extend into the alpine zone. Data with the Utah collection indicated grassy ridges and slopes at about timberline.

5. *Carex gynocrates* Wormsk.; Drejer, Nat. Tidssk. 3:434. 1841.

Plants with long slender rhizomes; culms 3-30 cm. high, slender, stiff and smooth; leaves clustered near base, blades 0.5 mm. wide, involute or folded; spike solitary, either dioecious or androgynous, loosely flowered, the 5-10 perigynia at length widely spreading or reflexed; scales light reddish-brown or brownish, short cuspidate to acuminate, shorter than perigynia; perigynia biconvex, 2.5-3.5 x 1.5-2 mm., yellowish or brownish-black at maturity, coriaceous,

ribbed, shining, abruptly contracted into a short beak.

#### DISTRIBUTION

*General*—Alaska to Greenland and southward to New York, Michigan, Colorado, Utah, and Nevada.

*Utah*—Only two specimens from Utah have been seen, McMillan's collection (No. 1105) from the Deep Creek Mountains and Willey's 301 from the Wasatch Plateau. A local and rare species in Utah.

#### HABITAT

*C. gynocrates* is a species of swamps and wet streambanks, and often associated with willow thickets. It is a plant of higher elevations in our area.

6. *Carex pyrenaica* Wahl., Sv. Vet.-Acad. Nya Handl. 24:139. 1803.

Cespitose in rather large clumps; culms 3-25 cm. high, erect, obtusely triangular, generally exceeding leaves; leaves 2-4 per culm, basal, blades channeled, 2-10 cm. long by 0.25-1 mm. wide; sheaths persistent, old leaves conspicuous; spikes solitary, androgynous, linear-oblong, 5-20 x 3-5 mm., staminate flowers few and inconspicuous; pistillate scales ovate, obtuse, dark-brown with narrow hyaline margins and lighter centers, shorter to as long as perigynia; perigynia jointed to rachis and deflexed at maturity, 3-5 x 0.8-1.5 mm., lanceolate to oblong, dark-brown to straw-colored, shining, glabrous, stipitate; beak about 0.5 mm. long, hyaline tipped.

*C. pyrenaica* can be separated from *C. nigricans*, a closely related species, in that it is more densely cespitose but generally with fewer and narrower leaves per culm; somewhat narrower, linear-oblong spikes; inconspicuous staminate flowers. However, at times *C. nigricans* will also have this latter characteristic or an occasional spike may be found that is entirely pistillate.

#### DISTRIBUTION

*General*—Our western American form extends south from British Columbia to Oregon, Utah, and Colorado. The species is also common to Europe and Alaska.

*Utah*—Mackenzie reports seeing a specimen of this entity from Utah, also Hayward (1952) listed it as a plant of the Uinta Mountains. The author also collected the species on the Uinta Mountains in 1956.

#### HABITAT

Hayward lists this species as a member of the alpine subclimax community of the Uinta Mountains. Found also near seeps and on alpine slopes.



7. *Carex nigricans* C. A. Meyer, Mem. Acad. St. Petersburg. Sav. Eta 1:211. pl. 7. 1831.

A rather loosely caespitose plant with stout creeping rootstocks; culms 0.3-3 dm. high, usually exceeding the leaves; leaves 4-9 per culm, light green, flat or channeled, 1.5-3 mm. wide; spikes solitary, androgynous, 6-9 mm. thick, the staminate flowers often conspicuous (usually over one-half length); pistillate scales dark-brown, much shorter than perigynia and deciduous; perigynia jointed to the rachis, reflexed and breaking away at maturity, 3.5-5 x 1-1.5 mm., brownish, stipitate at base and tapering into a smooth beak. (Plate II, III.)

#### DISTRIBUTION

*General*—Alaska and southward to Colorado, Utah, Nevada, and California. Also Aleutian and Commander Islands.

*Utah*—Limited collections available for study indicate that the species is confined to the northern part of the State. Specimens were checked from the Bear River, Uinta and Wasatch Mountains.

#### HABITAT

This is primarily a species of the spruce-fir zone meadows. It is sometimes found, however, in the lower alpine zone. Utah collections were generally from the better drained portions of the meadow and often in partial shade.

8. *Carex vernacula* L. H. Bailey, Bull. Torrey Club 20:417. 1893.

Culms singly or in small clumps and from long creeping rootstocks, 0.3-2 dm. high, obtusely angled, clothed at base with dried-up leaves; leaves clustered towards base, blades flat or channeled, 2-4 mm. wide; spikes numerous, aggregated and undistinguishable into an orbicular head; inconspicuous staminate flowers at the top; scales dark-brown, acute, largely concealing the perigynia; perigynia flattened-plano-convex, 3.5-4.5 x 1.5 mm., brownish in age, sharp-edged, not inflated, stipitate at base and contracted into a short smooth beak.

Maguire (Brittonia 5:199. 1944.) has assigned a plant collected from the Bear River Mountains to a variety of this species, *Carex vernacula* var. *hobsonii*. This entity differs from the main form in several important characters. It is a much taller plant with culms from 4-5 dm. high; leaves are confined to the lower third of the culms; the lower sheaths have undeveloped blades; rootstocks rather coarse and short creeping; scales light brown with lighter centers; perigynia conspicuously nerved dorsally and with serrate margins.

#### DISTRIBUTION

*General*—This species is confined to the

Rocky and Sierra Nevada Mountains of western United States.

*Utah*—Collections were studied from the Bear River and Uinta Mountains and from the Tushar Plateau. This sedge was found to be abundant in meadows near Big Flat and Puffer Lake, Tushar Plateau.

#### HABITAT

According to Mackenzie, this is a species of "open sunny places, and alpine slopes." Data with Utah collections indicates a habitat in meadows and moist sites, primarily of the spruce-fir zone.

9. *Carex perglobosa* Mack., Bull. Torrey Club 34:606. 1908.

Plants loosely caespitose from creeping rootstocks; culms 6-15 cm. high with dried-up leaves at base; leaves short and clustered at the base, 0.75-1.5 mm. wide, flattened at base and narrower above; spikes several in a globose head, androgynous; pistillate scales thin with a hyaline apex and margin; perigynia plano-convex, 4-4.75 x 1.75-2.5 mm., inflated, sub-stipitate at base and gradually tapering into a beak 1/4 to 1/3 the perigynium length.

It can be separated from *C. vernacula* by its filiform leaves, orbicular and silver hyaline margined scales, and inflated perigynia.

#### DISTRIBUTION

*General*—Colorado Rockies to La Sals.

*Utah*—Only from the La Sal Mountains has this plant been collected in Utah. There, it is locally frequent.

#### HABITAT

Rocky slopes and summits of high mountains.

10. *Carex douglasii* Boot, in Hook, Fl. Bor. Am. 2:213, pl. 214. 1839.

Culms arising, one or few together from long creeping, slender rootstocks, 6-30 cm. high, obtusely triangular; leaves 3-8 to a culm and clustered near base, blades 1-2.5 mm. wide, thick, flattened or canaliculate towards the base; heads usually dioecious, 1.5-5 cm. long and 7-15 mm. thick, consisting of many closely aggregated spikes; pistillate scales with wide hyaline margins, exceeding the perigynia in lengths; perigynia plano-convex, 3.5-4 mm. long and 1.75 mm. wide, stipitate at base and tapering or rather abruptly narrowed into a long serrulate beak; styles very long and conspicuous at flowering time.

This species is separated from the other members of the section by its large, usually dioecious heads.

## DISTRIBUTION

*General*—A common species throughout the western states and the northern Great Plains, and extending into southwestern Canada.

*Utah*—Widely distributed in Utah. Where records were absent from a few of the physiographic units, it was felt that incomplete collecting was the cause rather than the species absence from those areas. Collections examined from the Bear River, Uinta, Wasatch and Deep Creek Countains and from the Tavaputs, Wasatch, Aquarius and Markagunt Plateaus.

## HABITAT

The zonal range of this species is from the intermountain valleys to the spruce-fir. It is found more commonly, however, at the lower elevations. It prefers dry meadows and may even be found in rather alkaline sites. It is also quite characteristically found in lanes and yards where disturbance and trampling is above normal.

## FORAGE VALUE

Because of its tough, fibrous leaves, *C. douglasii* has a rather low palatability. As a result of its light use by grazing livestock, it has a tendency to increase where grazing pressure is excessive and the more desirable forage plants are weakened through grazing.

11. *Carex eleocharis* L. H. Bailey, Mem. Torrey Club 1:6 1889. (*C. stenophylla* Wahl. subsp. *eleocharis* (L. H. Bailey) Hulten).

Plants low growing (2.5-10 cm. tall) with the culms growing singly or few together from a very slender rootstock; leaves somewhat involute above and stiff; spikes closely aggregated into a solitary head, staminate flowers rather conspicuous, especially at flowering time; only a few perigynia develop at the base of each spike; scales light-brown, hyaline margined, obtuse, shorter to equalling perigynia; perigynia 2.5-3.2 x 1.5-2 mm., black at maturity and coriaceous, rather abruptly short beaked. This species is sometimes mistaken for *C. obtusata* in the field, the two species being similar in size and growth habits. They are rather easily separated, however, when the plants are headed out. *C. eleocharis* has more than one spike while *C. obtusata* is a unispoke species. Vegetatively they can be separated by the purplish-black rootstock and flat leaves of *C. obtusata* as compared with the brown rootstocks and narrowly involute leaves of *C. eleocharis*.

## DISTRIBUTION

*General*—*C. eleocharis* is primarily a plains species and reaches its greatest development in the northern Great Plains. From there its range extends westward to Nevada and eastern Oregon. It is also found in Alaska in prairie relics.

*Utah*—This species is rather widely distributed but only moderately abundant in Utah. Collections have been checked from the Uinta, Wasatch, La Sal and Abajo Mountains and from the Tavaputs, Wasatch and Fishlake Plateaus.

## HABITAT

A plant of rather dry sites. Most of Utah's collections came from sagebrush-grass types of midelevations. Here this little sedge often occupies the openings between the sagebrush. It tends to replace the taller herbaceous plants that have been eliminated from these inter-spaces through heavy grazing use.

## FORAGE VALUE

Limited observations would indicate that this sedge has a moderate palatability. Because of its small size, it is a low producer per unit area but its general occurrence within its type gives it importance as a forage plant.

12. *Carex simulata* Mack., Bull. Torrey Club 34:604. 1908.

Plants with slender, long creeping rootstocks; culms arising singly or few together, sharply triangular, 2-5 dm. high; leaves 2-5 per culm and on the lower third, blades flat or canaliculate; spikes several, densely aggregated, lower spike conspicuously pistillate, the other spikes entirely staminate or with a few perigynia or in some cases the entire head may be either mostly staminate or mostly pistillate; scales brown with hyaline margins, cuspidate, completely concealing the perigynia; perigynia 1.75-3 x 1.4-1.6 mm., unequally biconvex, chestnut-colored at maturity, shining and coriaceous, abruptly narrowed into a short, serrulate beak (about 1/4 length of perigynia).

It differs from *C. praegracilis* mainly in its smaller and abruptly shortbeaked perigynia and its slender, brown, creeping rootstocks.

## DISTRIBUTION

*General*—A species of western United States which has been collected from all the states of that group.

*Utah*—The species is widespread in Utah and appears from records to be rather frequent but local. All specimens seen were from Maguire's collection at the Intermountain herbarium. Specimens examined were from Cache Valley, the Wasatch Mountains and the Wasatch, Fishlake, Aquarius and Markagunt Plateaus.

## HABITAT

A plant of bogs and swamps. Its zonal distribution is from the intermountain valleys upward to the spruce-fir zone.



13. *Carex praegracilis* W. Boott, Bot. Gaz. 9:87. 1884.

Rootstocks long creeping, black, thick; culms 2-7.5 dm. high, sharply triangular, dried-up leaves at the base; leaves 2-5 per culm, blades flat or channeled, 1.5-3 mm. wide; spikes several, densely aggregated into a head, lower somewhat separate, androgynous, staminate flowers inconspicuous; in ours, the heads may sometimes be nearly all pistillate or staminate; scales light-chestnut with conspicuous hyaline margin, concealing the perigynia; perigynia plano-convex, 3-4 x 1.4-1.7 mm., brownish-black at maturity, tapering into a relatively long serrulate beak ( $1/3$ — $3/4$  length of perigynium body).

#### DISTRIBUTION

*General*—Widely distributed in western United States and extending eastward as far as Iowa and Michigan, northward to the Yukon Valley and southward to Texas and northern Mexico.

*Utah*—A common sedge throughout the State, but especially in the northern half. Collections studied were from the Uinta, Bear River, Wasatch and La Sal Mountains and the Tavaputs, Wasatch, Aquarius and Sevier Plateaus. Also from the intermountain valleys around Utah Lake, Bear River Valley and the Virgin River Valley.

#### HABITAT

Its habitat may be somewhat varied but it is most commonly found in damp bottomlands, often where conditions are alkaline. In the mountains it may be found in sagebrush-grass types, open parks and rarely under aspen. Its zonal range in Utah is from the southwest desert to the aspen-fir.

#### FORAGE VALUE

As a forage plant, its palatability is low. Limited observations would indicate that it is about equal to saltgrass. It is, however, abundant in places and furnishes considerable winter grazing for cattle and horses.

14. *Carex foenea* Willd., Enum. pl. 957. 1809. (*C. siccata* Dewey) see Rhodora 40:327-329. 1948.

Plants with long creeping, slender brown rootstocks; culms 1-9 dm. high, slender, arising singly or few together; leaves 4-7 per culm, blades 1-3 mm. wide, stiff; spikes 2-8, gynaeandrous aggregated or lower ones separate, terminal generally larger with a staminate base, middle spikes largely staminate, lower small and pistillate; scales medium-brown with silvery-hyaline margins and tan or green centers, generally acute, shorter to as long as perigynia; perigynia appressed-ascending, 4.5-6 x 1.75-2 mm., narrowly green-margined, more

or less nerved, tapering into a beak nearly the length of the perigynium body, obliquely cleft and bidentate with stigma and style protruding from well down the dorsal suture. Sometimes confused with *C. praegracilis* which has not the wing-margined perigynia of this species and has stout blackish rootstocks as compared with the slender brown rootstocks of *C. foenea*.

#### DISTRIBUTION

*General*—Transnorthern United States and southern Canada and extending southward in the western mountains to Colorado, New Mexico and Arizona.

*Utah*—Generally distributed through the mountains of central and southern Utah. Collections have been examined from the Wasatch, La Sal, Abajo, and Pine Valley Mountains and from the Wasatch, Aquarius and Markagunt Plateaus.

#### HABITAT

*C. foenea* prefers rather dry sites. On the La Sal and Abajo Mountains it was observed to be growing principally in the *Festuca thurberi* community and other open grasslands. Its zonal range extends from the intermountain valleys upward to the subalpine grasslands.

15. *Carex vallicola* Dewey, Am. Jour. Sci. II.32:40. 1861.

Plant caespitose but with short rootstocks; culms 2-6 dm. high, slender, sharply triangular, rough above; leaves about 3 to a culm, blades narrow (1-1.5 mm.), thin, basal; spikes in a dense terminal head, 15-20 mm. long and about 7 mm. wide, staminate flowers terminal and inconspicuous, with 2-5 or occasionally more perigynia per spike; scales brownish with wide hyaline margins, acute, or some short cuspidate, shorter than the perigynia; perigynia plano-convex, 3-4 x 1.6-2.2 mm., margined above, green or occasionally with brown tinging, abruptly narrowed into a minutely serrulate beak, about  $1/4$  the length of perigynium body, obliquely cleft and only slightly bidentate. It can be separated from the other Utah species of the section by its short, abrupt, obliquely cleft and entire to shallowly bidentate beak.

#### DISTRIBUTION

*General*—From the northern Great Plains southward and westward to Oregon, California, Mexico, Nevada, Utah and Colorado.

*Utah*—A frequent and widespread species in the State. Collections have been studied from the Bear River, Uinta, Wasatch, Sheeprock, La Sal and Deep Creek Mountains and the Tavaputs, Wasatch, Pavant, Sevier, and Aquarius Plateaus.

#### HABITAT

Ordinarily this species is associated with the sagebrush-grass type of moderate elevations,

but may extend from the foothills to the open grassy slopes of the spruce-fir zone.

#### FORAGE VALUE

Preliminary studies indicate that *C. valliscola* was an important constituent of the mountain grasslands and sagebrush-grass communities of our area. Owing to its relatively high palatability, the species has been adversely affected by heavy livestock grazing. This is indicated by its scarcity in ranges in poor condition and its common occurrence in those of fair or good condition. In utilization studies on cattle range this sedge is equal to the better native bluegrasses growing in the same site.

16. *Carex hoodii* Boott, in Hook. Fl. Bor. Am. 2:211. pl. 211. 1839.

Plant densely cespitose; culms slender, sharply triangular, 2.5-8 dm. high; leaves two to three per culm and basal, blades flat or channeled at base, 1.5-3.5 mm. wide, spikes 4-8, closely aggregated, forming a dense head, androgynous; scales chestnut-brown, with conspicuous hyaline margins, about as long as perigynia; perigynia plano-convex, 3.5-5 x 1.5-2.5 mm., brownish with age, green margined, beak 1/3 to 1/2 the body length, sharply bidentate and conspicuously sutured on both sides.

It differs from *C. occidentalis* in its larger and denser tufts, more closely aggregated spikes, larger perigynia and beak with both sutures conspicuous. (Plate II, III)

#### DISTRIBUTION

*General*—Western North American mountains, extending south from British Columbia, Alberta and South Dakota to Colorado, Utah, Nevada and California.

*Utah*—*C. hoodii* is a very common species throughout the mountains of north central Utah. It appears to reach its greatest abundance in the central Wasatch Mountains but it is also an important constituent of the herbaceous cover on the Bear River, and western spur of the Uinta Mountains and the Wasatch Plateau. The species was found to be locally abundant on the west end of the Tavaputs Plateau, the Tushar Plateau and the La Sal Mountains. One collection studied was from the Raft River Mountains.

#### HABITAT

It is a species that requires rather damp sites. Most commonly it is found growing along protected drainage bottoms, in open conifer, along north and east edges of conifer and aspen patches and in protected parks. Occasionally, it is associated with the grass community on open slopes. Its elevational requirement lies between the mountain brush and the spruce-fir zones.

#### FORAGE VALUE

This sedge furnishes considerable forage for both cattle and horses. This is mainly due to its abundance. Its relative palatability would be about medium, probably a little below that of slender wheatgrass. The plant is a good soil binder and lays down a good litter cover adjacent to the plant, thus giving it a high value as a watershed plant.

17. *Carex occidentalis* L. H. Bailey, Mem. Torrey Club 1:14. 1889.

Cespitose, rootstocks, short-creeping; culms 2-8 dm. high, exceeding leaves, slender and stiff; leaves about 3 per culm, blades 1.5-2.5 mm. wide; ligule longer than wide; spikes 5-10, upper aggregated, lower little separate, androgynous, staminate spike inconspicuous, and containing 10 or fewer spreading perigynia; scales brownish with opaque margins and green centers, acute to acuminate, slightly shorter to as long as perigynia and nearly concealing them; perigynia plano-convex, 2.5-4 x 1.25-1.75 mm., brownish in age, stipitate at base, nerved, abruptly narrowed into a serrulate, bidentate beak, sutures inconspicuous.

See description of *C. hoodii* for its separation from that species.

#### DISTRIBUTION

*General*—Rocky Mountains from Wyoming and Idaho south to Nevada, Arizona and New Mexico.

*Utah*—Most of the collections seen in Utah herbaria were from the northern portion of the State, particularly the Uinta, the Wasatch and the Bear River Mountains. Two sheets were studied from the Deep Creek Mountains and one each from the Tushar Plateau and the south edge of the Pine Valley Mountains.

#### HABITAT

This sedge is found growing in somewhat varied habitats. Collection data lists it from meadows, well-drained hillsides, and open timber types. It is most commonly found at mid-elevation zones but may extend upward to the spruce-fir zone or it may follow stream courses downward to the intermountain valleys.

18. *Carex cusickii* Mack., Piper and Beat- tie, Fl. N.W. Coast 72. 1915.

A rather large, coarse, tufted sedge, culms 7-12 dm. high and 4-6 mm. thick at base, aphyllopodic, much exceeding the leaves; leaves 3-4 blades per culm, 2.5-6 mm. wide, flat; sheaths septate-nodulose dorsally and red-dotted and copper-colored at mouth ventrally; heads decompound with upper spikes aggregated, spikes 4-8, androgynous with inconspicuous staminate flowers and from 5-10 spreading perigynia; scales brown with hyaline margins

and light centers, acute to acuminate, near the length of perigynia; perigynia biconvex, thick, 3-4 x 1.5 mm., coriaceous, shining, brownish-black when mature, strongly truncate at base, abruptly narrowed into a setulose-serrulate beak.

#### DISTRIBUTION

*General*—Vancouver, B.C. to Montana and Southward to Utah and California.

*Utah*—This species was reported from Utah by Mackenzie. There are, however, no specimens from Utah in the Utah herbaria.

#### HABITAT

Mackenzie states it is a wet meadow plant. It is probably confined to the lower elevations and obviously rare in this State.

19. *Carex stipata* Muhl., Willd. Sp. Pl. 4:233. 1805.

A stout, densely caespitose sedge, with weak, concave-sided culms that become flat on drying; leaf-blades 4-8 mm. wide, flat, flaccid; sheaths septate-nodulose dorsally and cross-rugulose ventrally; spikes numerous forming a compound terminal head, staminate flowers above and inconspicuous, each spike containing 4-10 ascending or spreading perigynia; scales thin, hyaline, narrow, from shorter to as long as perigynia; perigynia lanceolate, plano-convex, 3.8-5 x 1.5-2 mm., strongly nerved on both faces and tapering into a long serrulate beak. (Plate III)

#### DISTRIBUTION

*General*—A trans-North American species with a range from southern Alaska to Newfoundland and southward to North Carolina, Tennessee, Indiana, Kansas, New Mexico, Arizona and California.

*Utah*—Several collections of this species have been made in north-central Utah. All are from the central valleys and mostly from around the Great Salt Lake.

#### HABITAT

In Utah it is found in meadows and swamps of the intermountain valleys. It appears to be tolerant of alkali soils because of its occurrence around some of the bays of the Great Salt Lake.

20. *Carex disperma* Dewey, Am. Jour. Sci. 8:266. 1824.

Plant loosely caespitose with long slender rhizomes; culms 1.5-6 dm. high, slender, weak, nodding; leaves 3-6 per culm and bunched on the lower third, blades 0.75-2 mm. wide, thin and soft; spikes 2-4, small, containing from 1-6 ascending perigynia, upper aggregated, lower somewhat separate, one or two of the spikes with inconspicuous staminate flowers at the

tip; scales smaller than perigynia, deciduous, white-hyaline; perigynia unequally biconvex, 2-3 x 1-2 mm., thick, greenish, densely white punctate, abruptly short stipitate at the base, abruptly contracted into a minute beak.

This is the only Utah sedge of this section having androgynous spikes and long rhizomes.

#### DISTRIBUTION

*General*—Boreal forest zone. Alaska eastward across southern Hudson Bay to Labrador and Newfoundland and southward to Pennsylvania, Indiana, Minnesota, South Dakota, Colorado, Utah, and California.

*Utah*—Widely distributed in the State. It occurs frequently on the Uinta, Deep Creek and La Sal Mountains and is found occasionally on the Wasatch Mountains and on the Tushar and Fishlake Plateaus.

#### HABITAT

Mackenzie lists it as a species of "boggy coniferous woods." In Utah it has been collected from boggy meadows and damp woodlands. It appears to favor partial shade. Its zonal range extends from the mountain brush to the alpine.

21. *Carex praeceptorum* Mack., No. Am. Fl., pt. 2, p. 95. 1931.

Plants caespitose in small clumps; culms low growing (1-1.6 dm.), sharply triangular; leaves 3-5 per culm and clustered on lower fourth of culm, blades 1.25-2 mm. wide, erect, channeled; spikes 4-5, small, aggregated, gynaeandrous, containing 8-20 ascending to loosely spreading perigynia; scales light chestnut with hyaline margins and broad green centers, acute to acuminate, shorter than perigynia; perigynia plano-convex, thick, 1.5-2 x 1 mm., yellowish-brown to green with brown tinging, nerved, densely white-punctate, abruptly contracted into a small (about 0.33 mm.) serrulate beak, dorsal sutural line present.

#### DISTRIBUTION

*General*—This species was reported by Mackenzie as occurring in the mountains of California, Oregon, and Washington. He did however, include *C. canescens* var. *dubia* L. H. Bailey with the synonymy of *C. praeceptorum* with the type from the Bear River Canyon, Utah. A recent collection of this sedge by F. J. Hermann from Duchesne County and Lewis specimen number 125 from Wasatch County would definitely extend its known range to include Utah. It has also been collected from Nevada.

*Utah*—Collections would indicate that *C. praeceptorum* is a rather rare species of the Uinta and possibly the Bear River Mountains.



## HABITAT

The specimens from which collection data are available shows this species to be a meadow plant. It occurred frequently in a grass-sedge meadow of the spruce-fir zone at approximately 10,000 feet elevation.

22. *Carex bipartita* All., Fl. Ped. 2:265. pl. 89, f. 5. 1785.

Loosely caespitose; culms 0.5-3 dm. tall, sharply triangular above, slender and often curving; leaves clustered on lower fourth of culms, blades 1-2 mm. wide, flat with revolute margins; spikes 2-4, aggregated, the lower slightly separate, gynaeandrous; scales dark-brown with lighter centers and wide white-hyaline margins, obtuse, as wide but slightly shorter than perigynia; perigynia plano-convex, 2-3.5 mm. long, golden brown, veined on both faces, tapering and substipitate at base, tapering above to a conspicuous, reddish-brown, hyaline tipped beak 0.5-1 mm. long (0.8-1 mm. long in ours).

## DISTRIBUTION

*General*—Arctic alpine, from Alaska over northern Hudson Bay to Newfoundland and southward to British Columbia and Montana. Isolated in Utah. Also Greenland and Eurasia.

*Utah*—From Uinta Mountains. Maguire collected the species in the vicinity of Gilbert Peak.

## HABITAT

Meadows and swamps. Spruce-fir zone to alpine.

23. *Carex brunnescens* (Pers.) Poir. in Lam. Encyc. Suppl. 3:286. 1813.

Plants densely caespitose in small to medium sized clumps; culms 1-7 dm. high, slender and rather lax; leaves 1-2.5 mm. wide, flat, thin and deep-green; spikes 5-10, lower strongly separate, terminal gynaeandrous, clavate, lateral usually gynaeandrous; bracts setaceous, prolonged; scales white-hyaline with green centers, shorter than perigynia; perigynia plano-convex, 1.5-2.5 x 1-1.5 mm., greenish or brownish, nerved, tapering into a short (0.5 mm.) serrulate beak, dorsal suture conspicuous for the entire length of the beak and onto the main body of the perigynia. Closely related to *C. canescens*. It can be separated from that species in that its perigynium has thin, easily broken walls, raised nerves, longer beak, with a conspicuous dorsal suture extending its full length and onto the main body of the perigynium (Hulten, Fl. Alas. and Yuk. 1942).

## DISTRIBUTION

*General*—Southern Alaska to northern Lab-

rador and Newfoundland and southward to mountains of Tennessee and North Carolina to Georgia, Ohio, Wisconsin, Minnesota, Colorado, Utah, and Oregon. Also Greenland and Eurasia.

*Utah*—Confined mostly to the Uinta Mountains where it occurs rather frequently. One collection from the Tushar Plateau was studied.

## HABITAT

Bogs and wet meadows of the spruce-fir and alpine zones.

24. *Carex canescens* L., Sp. Pl. 974. 1753.

Plants densely caespitose; culms 1-8 dm. high, erect; leaves 5-8 per culm, blades 2-4 mm. wide, flat, glaucous-green; spikes 4-8, upper approximate the lower separate, heads erect or flexuose; bracts cuspidate; scales hyaline with green centers, ovate, acute, shorter than perigynia; perigynia plano-convex, 1.8-3 x 1.25-1.75 mm. green, thick, nerves usually obscure, contracted into an inconspicuous beak (shorter than 0.5 mm.), dorsal suture inconspicuous or obsolete. (*See C. brunnescens.*) (Plate III)

This sedge is highly variable and is represented by several forms in North America.

## DISTRIBUTION

*General*—Alaska to southern Hudson Bay and northern Labrador and Newfoundland and southward to Virginia, Indiana, Minnesota, Colorado, Arizona, Nevada, and California. Also, Greenland, Eurasia, South America, Falkland Islands, and Australia.

*Utah*—An occasional species through its range in the state. Collections studied from the Uinta, Wasatch, and La Sal Mountains.

## HABITAT

Wet sites along streams, lake edges and meadows of the spruce-fir zone.

## FORAGE VALUE

In none of the areas studied has this plant been found in sufficient quantities to be important as a forage plant; however, its relative palatability appears to be high. In areas where cattle are grazing it is difficult to find a plant that has not been grazed.

25. *Carex interior* L. H. Bailey, Bull. Torrey Club 20:426. 1893.

Plants densely caespitose; culms 1.5-5 dm. high, slender and wiry, aphyllopodic; leaves about 3 per fertile culm and on lower third, blades 1-3 mm. wide, thin flat, soft, yellowish green; sheaths tight and hyaline ventrally; spikes 2-4, generally forming a strict terminal head terminal spike peduncled, usually gynaeandrous, occasionally staminate; lateral spikes usually entirely pistillate, containing from 1-10

perigynia which are spreading at maturity; scales very obtuse, as wide but only half as long as perigynia; perigynia concavo-convex, 2.25-3.25 x 1.25-2 mm., thick, body widening just above base, rather abruptly contracted into a beak 1/4 to 1/3 the length of the body, ventral false suture inconspicuous.

This species closely resembles *C. angustior* but can be separated by its shorter, shallowly bidentate perigynium beak and inconspicuous ventral false suture.

#### DISTRIBUTION

*General*—Trans-United States and southern Canada, extending southward to Pennsylvania, Indiana, Michigan, Kansas, New Mexico, Arizona and northern Mexico.

*Utah*—*C. interior* has been collected in both the northern and southern parts of the State. Specimens studied were from the Bear River, Wasatch and Uinta Mountains and from the Markagunt and Paunsagunt Plateaus. It was listed as frequent to abundant on the plateaus. Its zonal distribution is from the intermountain valleys to the spruce-fir.

#### HABITAT

This plant grows in very wet sites, usually in the wetter parts of a meadow or in bogs. According to Mackenzie, it prefers calcium or non-acid sites.

26. *Carex angustior* Mack., in Rydb. F. Rocky Mts. 124. 1917.

Plants densely cespitose; culms 1-6 dm. high, very slender, aphyllodipodic; leaves 2-4 per culm, blades 0.75-2 mm., flat or canaliculate; sheaths hyaline and more or less red-dotted ventrally; spikes 3-5, approximate to little separate, terminal spike gynaeceandrous, the lateral pistillate, containing 5-15 widely spreading perigynia; scales yellowish with green centers, ovate, short cuspidate, equal to perigynia in length; perigynia plano-convex, 2.5-3.5 x 1.25 mm., light brown, sharp-edged, tapering into a sharply bidentate beak from one-half to equal the length of the perigynium body; beak conspicuously sutured on both sides (See *C. interior*.)

#### DISTRIBUTION

*General* — Trans - North America from Washington to Newfoundland and southward in the eastern U.S. to mountains of North Carolina and in the West to Colorado, Utah, Nevada, and central California.

*Utah*—The only specimens seen from Utah were collected from the Uinta Mountains and the Wasatch Plateau. Specimens checked were from the spruce-fir zone between 9,000 and 10,000 feet elevation.

#### HABITAT

Very wet meadows and bogs.

27. *Carex deweyana* Schw., Ann. Lyc. N.Y., 1:65. 1824.

Plants densely cespitose; culms slender, weak and generally spreading, 2-12 dm. high, old leaves conspicuous at base; leaves 3-6 per culm, blades thin, flat, 2-5 mm. wide, light-green; sheaths tight; spikes 3-4, upper approximate, gynaeceandrous with staminate flowers often somewhat separate, lower spikes widely separate and usually pistillate; scales very thin, whitish-hyaline with green centers, nearly size of perigynia; perigynia 4.5-5.5 x 1.5-2 mm., plano-convex, nerveless ventrally, obscurely nerved dorsally, strongly spongy at base, tapering above into a long (about 2 mm.) serrulate beak, shallowly bidentate at apex, dorsal suture conspicuous with a hyaline margin.

*C. deweyana* differs from *C. bolanderi* in its shorter more basal leaves, tight sheaths and shorter perigynium beak.

#### DISTRIBUTION

*General*—A boreal forest species, from upper Yukon River to the Great Lakes, southern Labrador and western Newfoundland, southward to Pennsylvania, Michigan, Iowa, South Dakota, Colorado, and Utah.

*Utah*—Two collections from the State have been studied, Maguire 21871 and Jones 1218. The Deep Creek and Wasatch Mountains were the only physiographic units represented. Collection data indicates that it is frequent on the Deep Creek Mountains.

#### HABITAT

Mackenzie lists it as a species of dry woodlands. Utah collections were from moist soils and stream-sides, of mid-elevation zones.

28. *Carex bolanderi* Olney, Proc. Am. Acad. 7:393. 1868.

Plants cespitose; culms slender but erect, 1.5-9 dm. high, sharply triangular with concave sides, old leaves conspicuous; leaves 2-5 per culm, 1-5 mm. wide, light or yellowish-green; sheaths loose; spikes 5-8, sessile, upper aggregated, lower more or less separate, staminate flowers basal and inconspicuous; scales brownish with green centers and hyaline margins, as wide but shorter than perigynia; perigynia 4-4.5 x 1-1.3 mm., plano-convex, strongly nerved, stipitate and spongy at base, rather abruptly tapering at apex into a conspicuous beak; beak serrulate, deeply bidentate, dorsal suture with light-brown margin.

#### DISTRIBUTION

*General*—A species of the mountains of



western North America. Mackenzie gives its range as extending from British Columbia and western Montana, southward to New Mexico and southern California.

*Utah*—No specimens from Utah were available for study. Mackenzie lists it as occurring in the State.

#### HABITAT

Open woodlands.

29. *Carex pachystachya* Cham., Steud. Syn. Cyp. 197. 1855.  
(*C. macloviana* D'Urville subsp. *pachystachya* (Cham.) Hulthen)

Plants very densely caespitose; culms slender, 3-10 dm. high, sharply triangular above, nearly smooth; leaves 3-5 per fertile culm, blades flat, 2-4 mm. wide, deep-green; spikes 4-12, closely aggregated, gynaeandrous with staminate flowers inconspicuous, containing 10-30, conspicuous, ascending perigynia; lower bract scale-like or short-awned; scales chestnut or blackish, acute, usually with a broad light midvein, about the width but shorter than perigynia; perigynia plano-convex, 3.5-5 x 1.5-2.25 mm., rather thick, copper-colored at maturity, narrow wing-margined, nerved dorsally, beak half the body length.

#### DISTRIBUTION

*General*—Alaska and southward down the western mountain chains to California, Utah, and Colorado. Isolated stations in eastern Quebec, Labrador, and Greenland. Also in Mexico, South America, and Falkland Islands.

*Utah*—A Utah specimen from the Wasatch Mountains has been checked (Cottam 1403, identified by Stacey).

#### HABITAT

From stream edges to xeric hillsides. Utah collection from near 10,000 feet elevation.

30. *Carex festivella* Mack., Bull. Torrey Club 42:609. 1915.

Plants caespitose; culms slender and stiff above, 3-10 dm. high, aphyllopodic; leaves 3-5 per culm and on lower fourth, flat, 2-6 mm. wide; spikes 5-20, densely aggregated into an ovoid head, gynaeandrous, containing 15-30 appressed-ascending perigynia; lowest bract generally prolonged but usually shorter than head; scales dark-chestnut or brown, shining, narrower and shorter than perigynia; perigynia thin and nearly flat to somewhat plano-convex, 3.65-4.75 (5) x 1.5-2 mm., ratio of width to length 0.39 to 0.5, light colored with dark beaks, strongly wing-margined at base and serrulate to middle, tapering into a long, nearly terete, bidentate beak. (Plate II)

This species is very closely related to *C. microptera*. Mackenzie separates them primarily by the darker, more shining scales and the broad wings of perigynia in *C. festivella*.

Our representatives of the two entities tend to grade into one another and are very hard to distinguish. In order to be consistent in identification, measurements below 0.25 mm. were considered as narrow, winged, 0.26-0.49 mm. medium winged, 0.5 mm. and over, wide winged. (Measurements were made from near the base of the achene.) Most of our *C. festivella* wing measurements fell in the medium class with a few considered as wide.

#### DISTRIBUTION

*General*—Primarily a species of the Rocky Mountains and Sierra-Cascade systems. It extends east, however, to Manitoba and the Black Hills of South Dakota and southward to northern Mexico.

*Utah*—A widely distributed and common species throughout the mountains and plateaus of Utah. Collections were studied from all units except the Stansbury Mountains and the Pavant Plateau.

#### HABITAT

Principally a plant of meadows and damp hillsides of mid-elevations. It may, however, extend as low as the mountain brush zone or upwards to the spruce-fir. It is often common along stream courses.

#### FORAGE VALUE

As a forage plant it is medium in palatability for cattle and horses and low for sheep. It is not eaten quite as readily as slender wheatgrass. In its habitat it is an important constituent of range in good condition.

31. *Carex microptera* Mack., Muhlenbergia 5:56. 1909.

Plants very densely caespitose; culms slender but strict, 3-10 dm. high, exceeding the leaves; leaves 3-5 per fertile culm, growing on lower third of culm, flat, firm, 2-4.5 mm. wide; spikes 5-10, aggregated into an ovoid head, gynaeandrous, with 15-30 spreading-ascending perigynia; lowest bract short-awned; scales light to dark-brown, shorter and narrower than perigynia; perigynia flattened to somewhat plano-convex, lanceolate, 3.6-4.8 x 1-1.8 mm., ratio of width to length 0.34 to 0.4, narrowly wing-margined (0.25 mm. or less), light-colored, serrulate, lightly to rather conspicuously nerved, tapering at apex into a beak one-half to one-third the body length; beak dark, nearly terete, bidentate. (Plate III)

In his original description of *Carex festivella*, Mackenzie stated "The closely allied *C. mic-*

*roptera* Mack. has narrower perigynia which are very narrowly margined at base and have more spreading beaks giving the head an echinate appearance . . . .”

#### DISTRIBUTION

*General*—Rocky Mountain and Sierra-Cascade systems from British Columbia and Alberta southward to Arizona and New Mexico.

*Utah*—This sedge is also common on the Utah mountains and high plateaus. Collections indicate that the species is particularly abundant through the Wasatch, Bear River, western Uinta Mountains and the Wasatch Plateau. Limited collections were available from the Aquarius Plateau and the La Sal, Abajo, Sheep Rock, and Pine Valley Mountains.

#### HABITAT

Primarily a species of meadows and along stream courses from the mountain brush upward to the spruce-fir zone. Occasionally it may be found growing in drier sites such as the sagebrush-grass community.

#### FORAGE VALUE

Observations indicate that this species is comparable as a forage plant to *C. festivella*.

32. *Carex ebenea* Rydb., Bull. Torrey Club 28:266. 1901.

Plants cespitose; culms 1.5-6 dm. high, exceeding the leaves, rather thick at base, erect aphyllopodic; leaves 3-5 per fertile culm, basal, blades flat, firm, 2-4 mm. wide; spikes 5-10, forming a dense head, each rather pointed at apex, staminate flowers at base and rather inconspicuous; lower bract shorter than head; scales brownish-black or black, as wide as but shorter than perigynia; perigynia somewhat flattened, narrowly lanceolate, 5-6.5 (7) x 1-2.3 mm., ratio of width to length 0.26-0.36, dark-colored, narrowly wing-margined at base, finely nerved, substipitate, narrowed above into a slender beak with shallow bidentate tip.

Separated from *C. haydeniana* by its generally narrow (0.25 mm. or less) wing-margin of perigynium and gradually narrowing, long, slender beak.

#### DISTRIBUTION

*General*—A sedge of the middle and southern Rocky Mountains, from Montana, Wyoming, and Utah southward to New Mexico and Arizona.

*Utah*—Found most commonly on the Uinta and La Sal Mountains where it may be locally abundant. Limited collections have been made from the Abajo Mountains and Tushar Plateau.

#### HABITAT

*C. ebenea* appears to be quite varied in its

moisture requirements and may be found growing anywhere from the mountain meadows to the alpine ridgetop. It appears, however, to prefer the moister sites. A species of the spruce-fir to the alpine zones. In the Uinta Mountains it is often found growing in open spruce stands.

33. *Carex haydeniana* Olney, in S. Wats. Bot. King's Sxpl. 366. 1871. *C. rubicola* Mack.)

Plants very densely cespitose; culms 1-4 dm. high, erect to decumbent, sharply triangular above, generally smooth, leaves 3-5 per fertile culm, basal, blades flat, firm, 1.5-4 mm. wide; spikes 4-7, densely aggregated but distinguishable into an ovoid or globose head, gynaeandrous, with 15-35 ascending perigynia; bracts scale-like or short-prolonged; scales black or brownish-black, ovate, acute, shorter and narrower than perigynia; perigynia flat, thin, 4-5 (6) x 1.75-3 mm., ratio of width to length 0.39 to 0.57, blackish or brownish-tinged, strongly winged, doubly serrulate, abruptly contracted into a conspicuous, bidentate beak. (See *C. ebenea*.)

#### DISTRIBUTION

*General*—Canadian Rockies and southward to New Mexico, Arizona, Nevada, and California.

*Utah*—Frequent through most of the mountains and higher plateaus. Collection sheets were studied from the Uinta, Wasatch, La Sal, Henry, and Deep Creek Mountains and from the Wasatch, Tushar, and Aquarius Plateaus.

#### HABITAT

This is primarily a species of alpine and subalpine slopes and ridges. Occasionally it may be found growing along stream courses. Hayward, 1952, stated that this is one of the common sedges of the late rock-covering stages and xeric sub-climax of the Uinta Mountains.

34. *Carex illota* L. H. Bailey, Mem. Torrey Club 1:15. 1889.

Plants cespitose from short-creeping rootstocks; 1-3.5 dm. high, slender, stiff; leaves 2-5 per culm, basal, blades flat or canaliculate, 1-3 mm. wide, rather stiff; spikes 3-6, forming a small suborbicular head, gynaeandrous; scales blackish with lighter center, wider to about length of perigynia; perigynia thick, plano-convex, 2.5-3.3 x 1.2-1.4 mm., edges not serrulate, dark tinged, strongly nerved, substipitate at base, tapering above into a rather short, smooth beak.

This species does not appear to be closely related to other members of the section. It can be separated from them by its small, black head



and lack of serrations on the perigynium beak.

#### DISTRIBUTION

*General*—British Columbia and south to Colorado, Utah, Nevada, and California.

*Utah*—Confined to the Uinta Mountains.

#### HABITAT

Observations and collection data indicate that *C. illota* grows primarily in meadows of the spruce-fir zone. It is often one of the more important constituents of the wet meadow community.

#### FORAGE VALUE

Moderately palatable to both sheep and cattle. In meadows near the head of the White-rocks River where observations were made, it was eaten along with other meadow plants and appeared to be equally palatable to the majority of them. Its relative abundance plus its palatability would make it an important forage plant of the Uinta Mountains.

35. *Carex subfusca* W. Boott, in S. Wats. Bot. Calif. 2:234. 1880.

Plants very densely caespitose; culms 1.5-6.5 dm. high, slender, stiff, sharply triangular, smooth, leaves basal, 3-5 per fertile culm, blades flat, light-green, 1.5-4 mm. wide; spikes 4-12, definite and clustered, gynaeandrous, with 8-24 closely appressed perigynia, lower bract usually shorter than head; scales reddish-brown, nearly as long and as wide as perigynia, acute; perigynia plano-convex, 3-3.5 x 1-1.5 mm., light-colored to occasionally dark brown, venation conspicuous dorsally, wing-margined to base and serrulate, abruptly contracted into a beak; beak about 1 mm. long, reflexed (in ours), light or dark brown, shallowly bidentate, dorsal suture full length of beak and with a hyaline edge.

#### DISTRIBUTION

*General*—From Oregon to southern California and eastward to Arizona, Colorado, and Idaho.

*Utah*—One collection, Lewis 216, from the Thousand Lake Mountain in Wayne County.

#### HABITAT

The Utah specimen was from a dry meadow bordering the north edge of an aspen strip, spruce-fir zone at near 10,000 feet elevation.

#### FORAGE VALUE

*Carex subfusca* appears to be equal to *C. festivella* in palatability. The specimen collected was from a temporary fenced plot. All herbaceous plants outside the plot had been completely consumed by cattle.

36. *Carex phaeocephala* Piper, Contr. U. S. Nat. Herb. 11:172. 1906.

Plants very densely caespitose and forming large clumps; culms 1-3 dm. high, slender, stiff and rough above; leaves 3-6 per fertile culm, clustered near base, blades canaliculate or nearly involute, 1.5-2 mm. wide; spikes 2-7, aggregated into a head, gynaeandrous; containing 10-20 appressed-ascending perigynia; lower bract short; scales brownish-black to reddish-brown with lighter centers and from narrow to wide hyaline margins, as long and as wide as perigynia and concealing them; perigynia concavo-convex, 4-5 (6) x 1.2-2 (2.5) mm., conspicuously wing-margined from top of achene to narrowed beak, nerved dorsally, abruptly contracted into a dark beak, 0.4-0.8 mm. long and conspicuously hyaline tipped.

#### DISTRIBUTION

*General*—Mountains of western North America from British Columbia southward to Colorado, Utah, Nevada and California.

*Utah*—This species has wide distribution through the mountains and high plateaus of Utah. Collections have been checked from the Bear River, Uinta, Wasatch, La Sal, and Deep Creek Mountains and from the Fishlake, Tusshar, Markagunt, and Aquarius Plateaus. It is a particularly abundant species in the high Uinta and La Sal Mountains.

#### HABITAT

This species is found growing on open, rocky hillsides, on soil patches of talus slopes, or open grasslands. It prefers timberline or a little above. It appears to be one of the early invaders of talus. It is of interest to note that the species is an important constituent of the the *Festuca thurberi* grassland community of the La Sal Mountains.

#### FORAGE VALUE

Low in palatability. In no instance where observations were made did this species show anything but very light use.

37. *Carex leporinella* Mack., Bull. Torrey Club 43:605. 1917.

Plants densely caespitose in large clumps; culms 1-3 dm. high, stiff, sharply triangular, smooth; leaves 3-5 to culm, basal, blades flat or involute, 0.75-1.5 mm. wide; spikes 3-8, aggregated but distinct, forming a stiff, erect, gynaeandrous head, containing 8-20 closely appressed perigynia; scales reddish-brown with conspicuous white-hyaline margins, concealing the perigynia; perigynia plano-convex, 3.5-4 x 1 mm., very narrow wing-margined; beak about one-fourth the length of perigynia, light-colored, white-hyaline at apex.

It can be separated from its near relative, *C. phaeocephala* by its smaller and much narrower perigynia, narrower leaves and smooth culms.

#### DISTRIBUTION

*General*—Mackenzie only knew this species from the mountains of California to Washington. Recent collections have extended its range to Nevada, northern Utah and Colorado.

*Utah*—Known in Utah by Lewis 122, collected from head of Provo River in the western spur of the Uinta Mountains, Wasatch County.

#### HABITAT

Mackenzie assigned this species to high mountain summits. The Utah plant was from a grass-sedge meadow (*Deschampsia caespitosa* and associates) of the spruce-fir zone at 9,300 feet elevation.

38. *Carex praticola* Rydb., Mem. N. Y. Bot. Gard. 1:84. 1900.

Plants cespitose in small clumps; culms 2-7 dm. high, sharply triangular, erect or nodding; leaves 2-4 per culm, near base, blades flat, 1-4 mm. wide; spikes 2-7, forming approximate or moniliform, flexuous heads, gynaeandrous; lowest bract scale-like or short-cuspidate; scales greenish to dull-reddish-brown with conspicuous white-hyaline margins, concealing the perigynia; perigynia plano-convex, 4-6.5 x 1.5-2.5 mm., light-colored wing-margined at base, tapering at apex into a long serrulate, obliquely cleft beak, hyaline apex.

#### DISTRIBUTION

*General*—Trans-North America from Alaska to Greenland and Newfoundland, southward to northern United States in the east and down the western mountain chains to Colorado, Utah, Nevada, and California.

*Utah*—One collection record known from the State, Hermann 5096 from the Chain Lake basin of the Uinta Mountains.

#### HABITAT

Fernald lists this as a species of open woods, meadows, praires and clearings. Its name denotes "prairie dweller". The Hermann specimen was collected from a "dry, rocky, lake shore," at 11,200 feet elevation. (See Graham's Fl. of Uintah Basin 1932).

39. *Carex eastwoodiana* Stacey, Leaflet West. Bot. 2:122. 1938.

Plants densely cespitose; culms 2-4 dm. high, rather stout, stiff, obtusely triangular above; leaves 3-6 per fertile culm, near base; blades flat or canaliculate, 1.5-4 mm. wide; spikes 2-5, aggregated into an erect head, the

lower often separate; lower bracts shorter than head; scales reddish-brown with lighter centers and white-hyaline margins, nearly concealing perigynia; perigynia concavo-convex, 5-6 x 1.75-2.25 mm., reddish-brown at maturity, margins green-winged, serrulate, spongy base, tapering into a long (2 mm.) beak, reddish-brown with hyaline apex.

*C. eastwoodiana* is very closely related to *C. petasata* and is considered by some taxonomists as a form of this species. It is separated from that species it is generally lower growing, culms are rather stout at their base and obtusely triangular above, perigynia are usually smaller.

#### DISTRIBUTION

*General*—Stacey gives its range as Montana, Idaho, Oregon, Wyoming and Utah.

*Utah*—Stacey observed specimens collected from the Wasatch, La Sal and Henry Mountains.

#### HABITAT

From meadows to sagebrush-grass communities. It appears to be most common at our mid-elevations.

40. *Carex petasata* Dewey, Am. Jour. Sci. 29:246, pl. W. f. 72. 1836.

Plants cespitose with a short rootstock; culms 3-8 dm. high, slender at base, sharply triangular above; leaves 2-5 per fertile culm, flat, firm, 2-3 mm. wide; spikes 3-6, aggregated into an erect head, gynaeandrous, staminate flowers inconspicuous; lower bract scale-like or short prolonged; scales acute, light-reddish-brown with lighter midvein and broad silvery-white hyaline margins, largely concealing the perigynia; perigynia plano-convex, 5.8-8 x 1.6-2.25 mm., yellowish-brown at maturity, narrow wing-margined, tapering into a long beak, hyaline tipped.

#### DISTRIBUTION

*General*—This is a Rocky Mountain species. Reported from Yakutat Bay, Alaska, by Holm. From there it extends southward to British Columbia and Saskatchewan and to Colorado, Nevada and eastern Oregon and Washington.

*Utah*—*C. petasata* is frequent over most physiographic units of the State. Collections have been checked from the Uinta, Wasatch, La Sal, Henry, and Deep Creek Mountains and the Tavaputs, Fishlake, Pavant, Tushar, Markagunt, Paunsagunt, and Aquarius Plateaus.

#### HABITAT

All collections of this species by the author have been from the mountain sagebrush-grass or grassland communities. It has, however, been reported from meadows and aspen type.

Zonal distribution may be from the intermountain valleys upward to 11,000 feet. On the La Sal Mountains, it was found growing in the *Festuca thurberi* community.

#### FORAGE VALUE

When growing in the same sites with *Agropyron spicatum*, it was found to be higher in palatability to that species. On heavily grazed range, it is generally found only within the protection of sagebrush. It was possibly one of the important sedges found in the mountain grasslands in pristine condition.

41. *Carex straminiformis* L. H. Bailey, Mem. Torrey Club 1.24. 1889.

Plants very densely caespitose; culms 1-4 dm. high; leaves 3-7 per fertile culm, on lower fourth, blades flat, 2-3.5 mm. wide, thick; spikes 3-10, closely aggregated into a head, gynaeceandrous, staminate flowers inconspicuous, containing numerous ascending-spreading perigynia; lower bract scale-like or short; scales reddish chestnut with green midrib and white-hyaline margins, shorter and much narrower than perigynia; perigynia flattened, concavo-convex, 4.5-5.5 x 2.5-3 mm., light-colored, strongly winged with crinkled margins, abruptly narrowed into a conspicuous, flat, serrulate beak.

This sedge is very closely related to *C. egglestoni* from which it can be separated by its lower growing form and by its lighter-colored and smaller perigynium.

#### DISTRIBUTION

*General*—Cascade and northern Sierra Nevada Mountains and eastward to Utah.

*Utah*—One Utah collection from Mount Timpanogos of the Wasatch Mountains was available for study, (Castle 76c, identified by F. J. Hermann).

#### HABITAT

The Utah specimen was collected from a cirque at about 10,000 feet elevation. It was growing in light, rocky soil. Mackenzie listed it as a plant of high mountain summits.

42. *Carex egglestoni* Mack., Bull. Torrey Club 42:614. 1915.

Plants densely caespitose; culms 4-8 dm. high, sharply triangular, stiff, erect, rather stout; leaves 4-6 to a fertile culm, blades flat, 2-6 mm. wide, thickish; spikes 3-6, closely aggregated into an ovoid head, gynaeceandrous, staminate flowers few, perigynia numerous and appressed-ascending; lowest bract short-prolonged; scales acute to short acuminate, reddish-brown with lighter midveins and narrow to wide hyaline margins, narrower and much wider

than perigynia; perigynia flattened-concavo-convex, 6-8 x 2-3.5 mm., olive-green to brownish; strongly winged and serrulate, abruptly contracted into a conspicuous, broad, flat, bidentate beak.

#### DISTRIBUTION

*General*—Northwestern Montana and southward through eastern Idaho to Utah, Nevada, and Colorado.

*Utah*—An abundant species through the higher mountains and plateaus of the State. Collections examined from the Bear River, Wasatch, Uinta, and La Sal Mountains and the Tavaputs, Wasatch, Fishlike, Tushar, and Markagunt Plateaus.

#### HABITAT

Most commonly found growing in the grass-forb communities of the upper montane zones. It may also be frequent in open parks of the spruce-fir zone. This is one of the two most common sedges growing in the *Festuca thurberi* community of the La Sal Mountains.

#### FORAGE VALUE

Limited observations indicate that *C. egglestoni* is moderately palatable to cattle. In areas where abundant, it is an important forage plant for cattle. Sheep seem to make only light use of it where grazing pressure is moderate.

43. *Carex xerantica* L. H. Bailey, Bot. Gaz. 17:151. 1892.

Cespitose from short-creeping rootstocks; culms 3-6 dm. high, stiff, erect; leaves 2-3 to a culm, clustered at base, blades flat, 2-3 mm. wide stiff; spikes 3-6, approximate but distinct, gynaeceandrous, staminate flowers inconspicuous, except in the terminal spike, with numerous closely appressed perigynia; lowest bract short; scales whitish to light-reddish-brown with green centers and wide white-hyaline margins, nearly concealing perigynia; perigynia flat, 4-5 (6) x 2-3 mm., greenish, straw-colored or light brown, broadly winged, serrulate, tapering into a flat, serrulate, bidentate beak, white-hyaline at orifice.

#### DISTRIBUTION

*General*—Primarily a species of the Great Plains but extending westward to Colorado, Wyoming, and Utah.

*Utah*—Recent collections would indicate that this is a wide-spread and relatively abundant species. Collections show it to be growing on the Uinta and La Sal Mountains and on the Aquarius Plateau. Future collections will probably bring it to light on other physiographic units.

#### HABITAT

In Utah *C. xerantica* is a plant of mid to



rather high elevations. Also, it is a member of grass-forb communities. On the Aquarius Plateau it was observed growing in large openings in aspen type at about 9,000 feet elevation. A plant considered to be that species was a member of the *Festuca ovina* community of the 11,000 foot top of that plateau. In the aspen opening, this sedge made up as much as 8 percent of the plant composition and was associated with such species as *Stipa lettermanii*, *Festuca thurberi*, *Agropyron subsecundum* and *Poa fendleriana* plus numerous forbs.

A recent collection of the species was made from the head of Lake Creek Basin in Wasatch County. Here it was a common constituent of an open grass-forb community of which *Stipa lettermanii* was the most common species.

#### FORAGE VALUE

This species could be considered as moderately palatable to cattle. On moderately heavy grazed range, it was utilized to the same intensity as *Stipa lettermanii* or about 25 percent.

44. *Carex athrostachya* Olney, Proc. Am. Acad. 7:393. 1868.

Plants cespitose in small to rather large clumps; culms 0.5-6 dm. high, slender, spreading; leaves 2-4 to a culm, blades flat, 1.5-5 mm. wide, yellowish-green; spikes 4-20, aggregated or somewhat separate below, gynaeceandrous, staminate flowers few, containing 15-40 appressed-ascending perigynia; one to three of lower bracts strongly developed; scales brownish with green centers and white-hyaline margins, narrower and shorter to nearly the length of perigynia; perigynia flat, 3-5 x 1-2 mm., wings medium to nearly obsolete, light-colored, tapering to a little flattened, serrulate beak, shallowly bidentate and hyaline at apex.

#### DISTRIBUTION

*General*—Alaska southward to British Columbia, Alberta, Saskatchewan, and North Dakota and down the western mountains to Colorado, Arizona, Nevada, and California.

*Utah*—Widely distributed through the central mountains and plateaus of the state. Collections were studied from the Wasatch, Uinta, and Pine Valley Mountains and from the Fishlake, Aquarius, and Markagunt Plateaus.

#### HABITAT

Meadow parks and stream sides from the intermountain valleys to the spruce-fir zone. It can often be found in intermittent streambeds or along road banks. Occasionally it grows on rather dry, rocky slopes.

45. *Carex saximontana* Mack., Bull. Torrey Club 33:439. 1906.

Plants cespitose; culms up to 3.5 dm. high,

slender, weak, strongly triangular, serrulate; leaves 2-4 to a culm, clustered near base, blades flat and rather lax, glaucous-green, 3-5 mm. wide; spikes 1-3, widely separated, lower on long peduncles, androgynous, pistillate part with 2-5 perigynia on a zig zag, triangular winged rachis, each subtended by a scale, lower scales much elongated to a leaf-like form and exceeding the inflorescence; perigynia 4-5 x 2-2.5 mm., obovoid, green, contracted into a stipitate base, abruptly contracted above into a short, conic beak. (Plate II)

#### DISTRIBUTION

*General*—British Columbia to Manitoba, western Minnesota, Nebraska, Colorado, Utah, Idaho, and eastern Oregon.

*Utah*—Mackenzie listed Utah within the range of this sedge. One specimen was collected by the author from the Wasatch Mountains (drainage of Hobbles Creek, Utah County).

#### HABITAT

Dry woods and thickets, intermountain valleys upward to mid-elevations.

46. *Carex filifolia* Nutt., Gen. 2:204. 1818.

Plants densely cespitose; culms 8-30 cm. high, filiform, wiry, broken off culms and leaves forming a fasciculate base; leaves 2-3 to a culm, bunched at base, blades wiry, acicular, involute, short, 0.25 mm. wide; spikes solitary, erect, linear, androgynous, upper half staminate, lower with 5-15 erect-ascending perigynia; pistillate scales light reddish-brown with conspicuous white-hyaline margins, broadly obovate, completely concealing the perigynia; perigynia ovoid or orbicular, 3-5 x 2-2.4 mm., obtusely triangular, puberulent above, light-colored, truncately narrowed into a short (1 mm. or less), hyaline beak.

*C. filifolia* and *C. elynoides* are often hard to separate. *C. filifolia* can usually be separated by its more conspicuous broadly white-hyaline pistillate scales and somewhat larger perigynia, with a rather conspicuous puberulence above. In our specimens of *C. elynoides*, the perigynia appear to be nearly glabrous and are only slightly scabrous above.

#### DISTRIBUTION

*General*—Praires, from Saskatchewan and Alberta to Texas and New Mexico and westward to Arizona, Nevada, Idaho, eastern Oregon, and California. Also in the Yukon.

*Utah*—The only known specimen from Utah is Harrison 8114 from the Buckhorn Wash, San Rafael Swell, Emery County.

#### HABITAT

This is primarily a prairie species. In the



mountain states it is generally associated with the sagebrush-grass communities of the river plains and intermountain valleys. It may, however, extend upwards to the lower montane zones.

#### GRAZING VALUE

*C. filifolia* is rather palatable to livestock. On cattle range where it was associated with *Festuca ovina*, *Agropyron spicatum* and native *Poa*, it was found to be equal in palatability to the *Agropyron* but more preferred than the *Festuca*.

47. *Carex elynoides* Holm, Am. Journ. Sci. IV. 9:356; 367. f.l. 1900.

Plants densely caespitose; culms 6-12 cm. high, filiform, wiry, erect, old culms and leaf blades broken off and forming a fasciculate base; leaves 2-3 per culm, blades wiry, stiff, acicular, involute, short. 0.25 mm. wide; spikes solitary, erect, linear, upper half staminate, lower with 4-8 erect-ascending perigynia; scales reddish-brown with dingy-white hyaline margins, thin, oblong-ovate, pistillate scales longer and wider than staminate and as long to longer than perigynia; perigynia obpyramidal-triangular, 2.5-4.2 x 1-2 mm., slightly puberulent or scabrous at base of beak, light-colored, often with dark tinging, tapering to base, abruptly narrowed into a cylindrical hyaline beak. 0.5-1 mm. long. (See *C. filifolia* for differences.)

#### DISTRIBUTION

*General*—A Rocky Mountain species. Montana and Idaho and southward to Wyoming, Colorado, Utah, and Nevada.

*Utah*—It has general distribution throughout the high mountains and plateaus of the State. Collections were studied from the Uinta, Wasatch, Deep Creek, and La Sal Mountains and the Fishlake, Tushar, and Markagunt Plateaus.

#### HABITAT

High mountain tops and exposed ridges. All Utah collections checked were from the upper spruce-fir and alpine zones. Where this species is protected by rocks or fallen logs, its height may be several times greater than where growing on more exposed sites.

#### FORAGE VALUE

Ordinarily this sedge is too short to be of much value as a grazing plant for livestock. At one site horses were observed grazing it.

48. *Carex obtusata* Lilj., Sv. Vet-Akad. Nya Handl. 14:69. pl. 4. 1793.

Culms slender, arising 1-3 together from slender, purple-black rootstocks, 6-20 cm. high;

leaves several, from near the base, blades, flat, channeled, 1-1.5 mm. wide; spikes solitary, androgynous, upper 2/3 staminate, lower 1/3 with 1-6 spreading ascending perigynia; scales thin, brownish, smaller than perigynia; perigynia dark, shining, 3-4 x 1.2-2 mm., suborbicular in cross-section, truncately stipitate at base, tapering into a short (0.5-1 mm. long), smooth beak, with hyaline tip and deep dorsal suture.

#### DISTRIBUTION

*General*—Alaska to Saskatchewan and southward across British Columbia to northern New Mexico and Utah. Widely distributed in Eurasia.

*Utah*—A rather common sedge through the central chain of mountains and plateaus. It is very common through the Joe's Valley depression of the Wasatch Plateau, on the Aquarius Plateau and the Thousand Lake Mountain. Collections were studied from the Uinta Mountains and Wasatch, Aquarius, and Sevier Plateaus. It was observed growing on the south end of the Wasatch Mountains and the Fishlake Plateau.

#### HABITAT

In Utah, *C. obtusata* is generally found at mid-elevations. It may, however, be found at elevations of 11,000 feet on the Aquarius Plateau. This sedge appears to be equally at home in open sagebrush-grass communities, under aspen shade, or in rather thick oakbrush types. When growing in the shade it has a longer and more lax leaf.

#### FORAGE VALUE

Like many of the low-growing grasses and sedges, *C. obtusata* appears to persist and even increase under heavy grazing use. In Scad Valley on the Wasatch Plateau, this little sedge often occupies the interspaces between the sagebrush while the taller grasses and sedges are confined to the protection of the brush.

49. *Carex rossii* Boott, in Hook. Fl. Bor. Am. 2:222. 1839.

Plants caespitose in medium sized clumps; culms 5-30 cm. high, slender, erect, reddish-purple at base, lower sheaths filamentose; leaves several, basal, blades 1-3 mm. wide, channeled above; terminal spike staminate, sessile or short peduncled; pistillate spikes 3-5, one or two above and contiguous, two or three from near the base on long or short, slender peduncles; lower bract leaf-like, normally exceeding the culms; scales greenish to brownish with green centers and hyaline margins, acute to acuminate, shorter than perigynia; perigynia 2.8-4.5 x 1.2-2.5 mm., short-pubescent, green often dark above, 2-keeled and stipitate; beak conic, 0.75-1.5 mm. long, ciliate-serrulate and deeply bidentate. (Plate III)

## DISTRIBUTION

*General*—Alaska and Yukon southward to Manitoba, Minnesota, Black Hills of South Dakota, Colorado, Utah, Nevada, and California. Isolated in Michigan.

*Utah*—*C. rossii* is widespread and common in Utah. Specimens have been examined from the Uinta, Bear River, Wasatch, La Sal, and Deep Creek Mountains and from the Tavaputs, Sanpitch, Tushiar, and Markagunt Plateaus and a desert mountain in western Utah. This species was observed growing on the south end of the Pavant Plateau.

## HABITAT

Ross sedge grows in quite varied sites. It is most characteristically found in open timber stands from the pinyon-juniper to the spruce-fir zones. Occasionally it is found in open grasslands and alpine slopes. This is one of the more common herbaceous plants growing under the ponderosa pine on the east side of the Aquarius Plateau. Above Panguitch Lake on the Markagunt Plateau it can be found growing under the aspen. In the large basins just under the Uinta peaks, it is a common forest floor species under Engelmann spruce. Often it is an associate of *C. geyeri*.

## FORAGE VALUE

As a forage plant it is poor to good depending on the sites on which it is growing. In the dry pinyon-juniper site it may not be grazed evenly by cattle but in the aspen parks sheep were observed to be grazing it rather heavily.

50. *Carex pityophila* Mack., Bull. Torrey Club 40:545. 1913.

Plants cespitose in large, dense clumps; culms 10-15 cm. high, much shorter than leaves, slender, sharply triangular and rough; leaves 5-10 to a fertile culm, blades erect, flat, 0.75-3 mm. wide; lower sheaths filamentose; terminal spike staminate, peduncled; pistillate spikes 2-5, upper 1 or 2 contiguous, the others on slender peduncles from base, upper ones containing 1-3 perigynia; bract of upper spike leaf-like; pistillate scales acute, purplish-brown-tinged, about the size of the perigynia; perigynia 3.5-5 x 1.75-3 mm., 2-keeled, puberulent, green, suborbicular in cross-section, strongly stipitate; abruptly contracted into a beak, 0.75-1 mm. long, shallowly bidentate.

## DISTRIBUTION

*General*—Southern Colorado and southeast Utah to New Mexico.

*Utah*—One poor specimen from the La Sal Mountains was available for study. Mackenzie listed it as a species of Utah.

## HABITAT

Primarily a species of ponderosa pine and oakbrush types.

51. *Carex pseudoscirpoidea* Rydb., Mem. N. Y. Bot. Gard. 1:78. 1900.

Loosely cespitose from long-creeping rootstocks; culms 1.5-3.5 dm. high, stiff, triangular, old leaves conspicuous at base; leaves 5-10 to a culm and basal, blades 2-3 mm. wide, thickish, flat above; spike solitary, dioecious, both kinds of spikes closely many-flowered; scales brownish-black, with white-hyaline margins, staminate erose-ciliate, pistillate with lacerate and ciliate apex, pubescent; perigynia obovoid, 2.4-3.2 x 1.25-1.6 mm., strongly pubescent, abruptly contracted into a slender beak, 0.5 mm. long.

Some of the earlier collections from the state were referred to *C. scirpoidea*. It is now considered that the Utah material belongs to the above described species. (Plate III)

## DISTRIBUTION

*General*—Montana and Washington and southward to Colorado, Utah and Nevada.

*Utah*—A common species of the Uinta Mountains. Specimens have been checked from the Bear River, Uinta, and La Sal Mountains.

## HABITAT

This sedge is an important constituent of the more highly-developed alpine tundra community. It tolerates a rather wide range of moisture availability from xeric alpine ridges to meadows. Although common to the drier sites, it grows more luxuriantly where moisture is more plentiful such as seeps and meadows.

## FORAGE VALUE

Moderately palatable and grazed by both sheep and cattle.

52. *Carex drummondiana* Dewey, Am. Jour. Sci. 29:251. pl. Y., f. 82. (*C. rupestris* Bellard:ex All.) 1836.

Plants loosely cespitose from long, slender rootstocks; culms low (6-12 cm. tall), stiff, erect, sharply triangular and roughened above, purple at base, old leaves conspicuous; leaves 8-12, basal, blades flat, canaliculate, 2-4 mm. wide; spikes solitary, androgynous, containing 1-6 erect-ascending perigynia, upper 2/3 staminate; pistillate scales orbicular-ovate, light to dark-brown with conspicuous white-hyaline margins and lighter centers, shorter to as long as perigynia; staminate scales lighter-colored and narrower; perigynia 3-4.5 x 1.6-2.4 mm., 2-keeled, triangular flattened, greenish-white and tinged with brown, substipitate at base and abruptly minutely beaked, apex white-hyaline, rough to entire. (Plate III)

## DISTRIBUTION

*General*—Rocky Mountains, British Columbia, Wyoming, Utah, and Colorado.

*Utah*—Collections would indicate that *C. drummondiana* is confined to the Uinta Mountains. Observations on a very limited portion of that mountain would indicate that it is relatively abundant in suitable habitats.

#### HABITAT

Where the collections were made, this species was the dominant plant on very rocky south faces above timberline (about 11,500 ft. elevation). The ground surface area was about 2/3 rock and only about 1/3 soil. This little sedge formed a heavy cover in the soil patches between the rocks. It was also observed to be a common species on dry alpine ridgetops.

53. *Carex geyeri* Boott, Trans. Linn. Soc. 20:118. 1846.

Loosely cespitose with thick, elongate rootstocks; culms 1-4 dm. high, erect or nodding, stiff, sharply triangular, aphyllopodic; leaves generally 2 developed ones to a culm, 2-4 mm. wide, tough, flat or canaliculate, tips often dry; with numerous sterile shoots; spike androgynous, staminate part linear and short peduncled above 1-3 perigynia; pistillate scales greenish, exceeding the perigynia, the lower one often short-awned; perigynia 5.5-7 x 2.5-3.5 mm., triangular, 2 ribbed, short-stipitate and tapering at base, abruptly short beaked at apex. (Plate III)

#### DISTRIBUTION

*General*—British Columbia and Alberta southward to Colorado, Utah and northern California. Introduced to Pennsylvania.

*Utah*—One of the more common sedges of the state. Collections studied were from the Bear River, Uinta, Wasatch and La Sal Mountains; the Sanpitch, Pavant and Tushar Plateaus. It has also been observed on the Wasatch Plateau.

#### HABITAT

*C. geyeri* is primarily a species of open woodlands. In Utah, it is most commonly found associated with oakbrush and with the Douglas fir-white fir association. On the La Sal Mountains where the species seems to reach its greatest importance in Utah it is the dominant herbaceous plant under the oakbrush and some of the younger stands of aspen. Although this species is most common at mid-elevations, it is not confined to those zones. It grows commonly under Engelmann spruce and lodgepole pine on the Uinta and Wasatch Mountains and may extend up to timberline. It appears to have been an important constituent of its community in pristine condition.

#### FORAGE VALUE

The foliage of this plant is tough and fibrous, consequently it is only lightly grazed

during the season when other forage plants are green and lush. However, in the fall when other herbaceous plants begin to dry up, *C. geyeri* remains green. Cattle have been observed to graze the plant heavily at that time. This sedge remains green even under a snow cover. Elk are reported to dig it from under 2 to 3 feet of snow.

54. *Carex aurea* Nutt., Gen. 2:205. 1818.

Plants loosely cespitose with long, slender rootstocks; culms 0.5-5.5 dm. high, slender, erect, triangular and roughened above; leaves several per culm, basal, 2-4 mm. wide, flat above; spikes loosely few-flowered, terminal spike staminate or occasionally gynaeandrous or androgynous; lateral spikes 3-5, generally pistillate, upper approximate, lower separate; bract leaf-like, long sheathing, exceeding inflorescence; scales ovate, obtuse to short-cuspidate, reddish-brown to greenish with conspicuous 3-nerved green centers and white-hyaline margins, smaller than perigynia; perigynia orbicular-obovoid, 2-3 x 1.5 mm., fleshy, translucent and golden-yellow or brownish at maturity, short stipitate, nearly beakless.

#### DISTRIBUTION

*General*—Boreal forest species. Alaska and Mackenzie Mountains to Newfoundland and southward to Pennsylvania, Indiana, Michigan, Nebraska, New Mexico, northern Arizona, Nevada, and California.

*Utah*—Rather common throughout the state. Study was made of collections from the Bear River, Uinta, Wasatch, Deep Creek, and La Sal Mountains and the Wasatch, Tushar, Markagunt, and Paunsagunt Plateaus. Also one collection from the White River Canyon in San Juan County.

#### HABITAT

Bogs, meadows and streambanks from the intermountain valleys to above timberline. In Ephraim Canyon on the Wasatch Plateau it was found growing in freshly deposited calcareous mud.

55. *Carex hassei* L. H. Bailey, Bot. Gaz. 21:5. 1896.

Loosely cespitose; culms .5-2.5 dm. tall, from long rootstocks; leaves 2-4 mm. wide, flat; spikes 3-5, mostly remote, the terminal usually staminate but many gynaeandrous, androgynous or all the spikes pistillate; lower bract leaf-like, short-sheathing, inner summit of sheath truncate; pistillate scales ovate, firm, obtuse, to acuminate or with awns (2-6 mm. long), dark-brown to tan or mostly hyaline with broad 3-nerved light centers and white-hyaline margins and apex, generally shorter



and narrower than perigynia; perigynia 2.5-3 mm. long, whitish or greenish, ovate to obovate, biconvex and somewhat flattened, rounding to tapering at base, contracted at apex to a very short beak. (Plate III)

#### DISTRIBUTION

*General*—A species of western United States (Colorado, Arizona, Utah, Nevada, and California).

*Utah*—Limited collections. Found on and near the Uinta and Wasatch Mountains and from Colorado drainage in southeast Utah.

#### HABITAT

Wet meadows and bogs, intermountain valleys and canyons to the aspen-fir zone.

56. *Carex garberi* Fern., *Rhodora* 37:253. 1935.

Loosely cespitose from long slender rootstocks; culms 3-5 dm. high, slender, triangular; leaves flat, erect, shorter to longer than culms, blades 1.5-2 mm. wide (ours), light green, roughened, especially on the attenuate tips; terminal spikes staminate or androgynous, occasionally all spikes of a culm may be pistillate; lateral spikes 2-7, pistillate, densely crowded, especially above, sometimes the basal ones are on long, slender peduncles; lower bract leaf-like, shorter to exceeding culms, rather long sheathing (ours), "V" shaped or arcuate at inner summit of sheath; scales brown with 3-nerved green centers and white-hyaline margins, nearly as wide and half as long as perigynia, rounding to short mucronate at tip; perigynia 2-2.5 mm. long (ours), biconvex, rather plump, ellipsoid to obovoid, green, dry, somewhat white papillate, substipitate at base, rounded to somewhat tapering to a nearly beakless apex.

The small perigynia would indicate that our entity belongs to the typical variety rather than to var. *bifaria* Fern., *Rhodora* 37:255. 1935. The culms of our entity are rather tall and lax, however, as is common to the var. *bifaria*. This latter form has perigynia from 2.5-3 mm. long. Ripley and Barneby (*Leafl. West. Bot. IV:208. 1945*) considered their collection No. 6286 from White Pine County, Nevada as the typical variety.

#### DISTRIBUTION

*General*—Area of the Great Lakes, Canada and United States, westward and southward to North Dakota, Nevada and Utah.

*Utah*—This form appears to be confined to the deep canyons of the Colorado in the southeastern portion of the state.

#### HABITAT

River banks and seeps.

57. *Carex crawei* Dewey, *Am. Jour. Sci. II.* 2:246. 1846.

Culms growing singly or few together from long-creeping rootstocks, 1-3 dm. high, obtusely triangular, phyllopodic, old leaves conspicuous at base; leaves numerous, basal, light-green with blades 1.5-3 mm. wide; terminal spike staminate and long peduncled; pistillate spikes 2-4, separate, nearly sessile, oblong-cylindric with 10-45 ascending perigynia; bracts leaf-like, sheathing, 15 mm. long or less; scales reddish-brown with hyaline margins and green centers, mucronate to cuspidate, smaller than perigynia; perigynia ovoid, orbicular in cross-section, 3-3.5 x 1.25-2 mm., light-colored, beak very short with hyaline tip.

#### DISTRIBUTION

*General*—Alberta to Quebec southward to Maine, northwest Connecticut, New Jersey, Alabama, Missouri, Kansas, Wyoming, Utah, and Washington.

*Utah*—Only one specimen from Utah was available for study. Maguire 18,828 from the Marl Bogs at the base of the Paunsagunt Plateau in Kane County.

#### HABITAT

Wet, high calcium soils. Our specimen was from relatively low elevation.

58. *Carex capillaris* L., *Sp. Pl.* 977. 1753.

Plants cespitose in small clumps; culms 0.3-4 dm. high, very slender, reclining or spreading, smooth, old leaves conspicuous at base; leaves numerous, basal, flat, 0.75-3 mm. wide; terminal spike staminate or occasionally gynaeandrous, very slender, usually overtopping the uppermost pistillate spike; pistillate spikes 2-3, very slender, elongate, on drooping peduncles, containing from 3-20 ascending, loosely arranged perigynia; bracts long or occasionally short-sheathing, tubular; scales small and thin, light-chestnut, broadly hyaline margined, early deciduous; perigynia 2-4 x 0.5-1.5 mm., obtusely triangular in cross section, strongly stipitate, beak minute, scabrous at base, conic, purple-tipped.

#### DISTRIBUTION

*General*—Alaska to Labrador and Newfoundland southward to New York, Indiana, Michigan, Wisconsin, Manitoba, New Mexico, Utah, and Nevada. Also Greenland, Iceland, and Eurasia.

*Utah*—Specimens checked from the Bear River and Deep Creek Mountains and the Margagunt Plateau. Hermann collected the species on the Uinta Mountains.

#### HABITAT

Utah collections were from wet meadows

and rocky alpine tundra, with elevations from lower montane to alpine.

59. *Carex viridula*. Michx., Fl. Bor. Am. 2:170. 1803.

Plants densely caespitose in small clumps; culm 0.5-4 dm. high, stiff, erect, leafy; leaves 4-8 per culm, blades light-green, thickish, flat or channeled, 1-3 mm. wide; terminal spike normally staminate; pistillate spikes 2-6, oblong to globose-oblong, containing 15-30 spreading perigynia; bracts much exceeding inflorescence, short- to long-sheathing (2-15 mm.); scales small, rounded to short cuspidate, reddish to brown with green centers, shorter than perigynia; perigynia 2-3 x 1.25-2 mm., obovoid, yellowish-green, substipitate at base, strongly nerved, with minutely bidentate beak about  $\frac{1}{3}$  the length of perigynium body; achenes black and shining at maturity.

#### DISTRIBUTION

*General*—Alaska to Ontario and Newfoundland, southward to New Jersey, Illinois, Indiana, New Mexico, Utah, Nevada, and California. Also southern Greenland and eastern Asia.

*Utah*—Two collections by Maguire were examined. Maguire 18,839 from the south end of the Paunsagunt Plateau and Maguire 19,546 from the vicinity of Navajo Lake on the Markagunt Plateau.

#### HABITAT

Mackenzie lists this as a species of "seepy lake and river banks in calcareous districts." One of the Utah specimens was from a marl bog and the other from near a mountain lake in basaltic formation. Zonal distribution was from the mountain brush to the spruce-fir.

60. *Carex misandra* R. Br., Chlor. Melv. 25. 1823.

Plants densely caespitose; culms 1-5 dm. high, slender and erect but nodding above, much exceeding leaves, old leaves conspicuous at base; leaves numerous and clustered at base, blades 1.5-4 mm. wide, stiff, canaliculate below; terminal spike gynaeandrous or staminate, slender peduncled and drooping; pistillate spikes 2-3, the lower ones nodding on slender peduncles; lower bract long-sheathing; scales ovate to lanceolate, thin, blackish with white hyaline apex, shorter to equalling perigynia; perigynia narrowly lanceolate, 3-5 x 1-1.5 mm., light colored below, purplish black above, 2-edged, tapering and short stipitate at base, long tapering above to a long beak, beak with ciliate-serrulate margins and white-hyaline apex. (Plate III)

#### DISTRIBUTION

*General*—An arctic-alpine species. Alaska to

Greenland south to northwest Labrador, southern Hudson Bay, and Alberta. Isolated in the mountains of Utah and Colorado.

*Utah*—An occasional species in the mountains of Northern Utah. Collections checked from the Uinta and Wasatch Mountains.

#### HABITAT

More mesic portions of the open alpine tundra and grasslands.

61. *Carex ablata* L. H. Bailey, Bot. Gaz. 13:82, 1888.

Plants growing in dense, medium-sized clumps; culms slender, erect, 2.5-6 dm. high, exceeding leaves, old leaves conspicuous at base; leaves several, lower clustered at base, blades 2-5 mm. wide, light-green, flat; terminal spike staminate or with few perigynia, generally sessile, lateral spikes pistillate or occasionally androgynous, oblong, the lower separate on rough, rather long peduncles, drooping; bracts leaf-like, exceeding culm, long sheathing; scales ovate, purple-black with lighter center which is often extended dorsally to a short serrulate tip, shorter than perigynia; perigynia lanceolate, 3.5-5.5 x 1.25-2 mm., straw-colored to brown, usually purplish tinged, 2-ribbed, rounded and short-stipitate at base, hardly differentiated into a bidentulate beak.

#### DISTRIBUTION

*General*—British Columbia and southward to Montana, Wyoming, Utah, and Nevada.

*Utah*—Species reported from the State by Mackenzie, no Utah material seen.

#### HABITAT

Mackenzie lists it as a species of "mountain bogs and meadows."

62. *Carex fissuricola* Mack., Muhlenbergia 5:53. 1909.

Plants densely caespitose; culms 5-8 dm. high, erect, much exceeding leaves, old leaves conspicuous at base; leaves several per fertile culm, lower clustered, upper 2 or 3 separate, blades 3-8 mm. wide, striate; terminal spike staminate or with few perigynia at base; pistillate spikes 4-5, upper sessile and aggregated, lower separate and peduncled; bracts long-sheathing, with short leaf-like blades; scales brownish-black with light midvein extending beyond to form an acute to short-awned apex, narrower and shorter than perigynia; perigynia 4.5-5 x 1.75-2 mm., ovate, much flattened, sparsely hairy when young, green, purplish tinged, ciliate-serrulate margins, rounded and short stipitate at base, abruptly contracted into a bidentate beak (Plate II)